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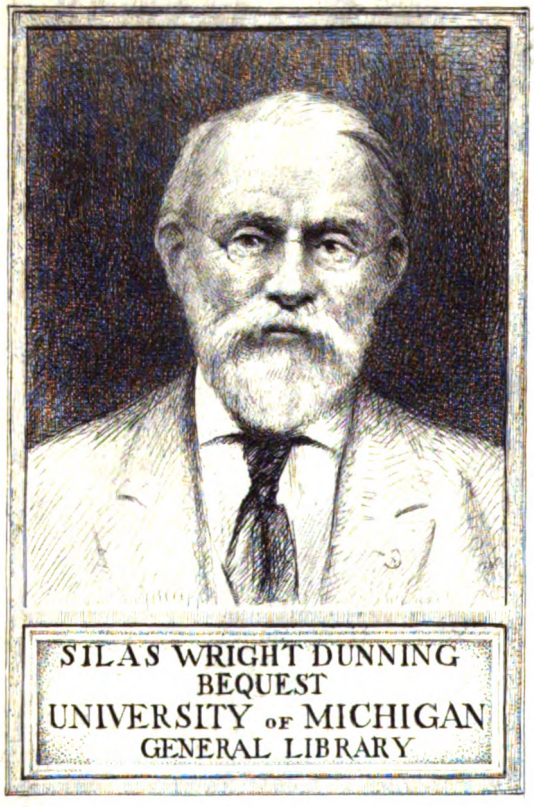
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KAFIRISTAN.

SECTION I.

THE BASHGELI KAFIRS AND THEIR LANGUAGE (KALASHA.)

BY

DR. G. W. LEITNER,

(late on a linguistic Mission by order of the Panjab Government), Offg. Director of Public Instruction, Panjab.

SIMLA, *5th September* 1879.

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INTRODUCTION.

IMMEDIATELY before, and at the conclusion of, Dr. Bellew's able and instructive Lecture on Kafiristán and the Kafirs, the gem in which, I think, is his attempt to identify the Gandharidæ of the Greeks with the Kamoji Kafirs, Sir Robert Egerton, who has always taken an interest in my linguistic enquiries, strongly urged me not to delay any longer the publication of my material regarding the Siah Posh Kafirs which I had collected in 1866-67 and to which I had added in 1872.

Accordingly, I began writing out some notes that I had with me on one—the first—of the Kafir dialects, with which I had come in contact, intending to send them, when elaborated, to a philological paper, when Captain A. D. Anderson, the indefatigable Secretary of the United Service Institution of India, diverted their destination to this Journal by kindly assuring me that with a sketch of the manners of the Bashgeli Kafirs, a Map of Kafiristán and surrounding countries, and some illustrations, I might make the linguistic portion acceptable to the Indian public, especially now that travellers of the determination of Major Tanner were bent on exploring the remaining mysteries of Káfiristán and that all the other countries included in, what was once called, the "Neutral Zone" were attracting so much general attention. My sketch and notes were ready on the 5th September last, but the reproduction of the Photographs and Drawings, which, I regret to say, has not been so successful as usual, has delayed the publication of my paper beyond the time during which it might have possessed an immediate value.

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UNITED SERVICE INSTITUTION OF INDIA.

NOTICE is here given that the subject of the Essay for the Institution Gold Medal, for this year, is "A Transport Service for Asiatic Warfare."

The terms of competition are :—

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2. The Essays must be legibly written, or printed, not exceeding 32 Pages of the Size and Style of the Journal.

3. The Essays must be forwarded to the Secretary on or before the 1st May 1880.

4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the Candidate inside.

5. The Essays will be submitted for decision to three Referees chosen by the Council.

6. The successful Candidate will be presented with the medal at the Annual Meeting (if he be present), and his Essay will be printed in the Journal.

By order of Council,

A. D. ANDERSON, CAPT. R. A.,

Secretary, United Service Institution of India.

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By order of the Council,

A. D. ANDERSON, CAPT., R.A.,

Secretary, United Service Institution of India.

SIMLA,
31st April 1880.

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The Secretary will be happy to send an Index to volumes I, II, III, IV, V, VI and VII to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Secretary, United Service Institution of India.

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ORIGINAL PAPERS.

I.

THE TRIBES OF TURKISTAN.

No. II.

BY CAPT. J. M. TROTTER,

DEPUTY ASSISTANT QUARTER MASTER GENERAL.

(*Continued from No. 34.*)

THE TAJIKS.

Before the invasion of Mawar-un-Nahr by the Arabs and Turks, and indeed as far back as the earliest dawn of the legendary history of Western Turkistan, the fertile countries bordering on the Oxus and Jaxartes and their tributaries were inhabited by an Iranian race speaking a language akin to, or identical with that of Ancient Persia, and probably professing the religion of Zoroaster. The same race were at this time in possession of Persia, Khurásán and of parts of Afghanistan and may be considered as the ancestors of the bulk of the sedentary population of these countries. Among the most important of the peoples directly descended from this ancient stock, are the Tajiks of Western Turkistan who are treated of in this paper.

The Tajiks, for the purposes of this article, will be classed under two headings:—*First*, the Tajiks of the plains, a race in which the Iranian blood has suffered more or less from the admixture of Turkish and possibly other strains, and *Secondly*, the Tajiks of the hills or Galchas, who are the purest specimens of the race. This subdivision, though as will be seen a convenient one in practise, is perhaps less satisfactory from an ethnological point of view than that proposed by Ujfalvy, who speaks of the Tajiks as including three varieties of Iranians; *1st* the aboriginal Iranians, including the Galchas and a few communities* of pure blood which he claims to have identified in Farghana; *2ndly* Persian Colonists, and *3rdly* the descendants of Persian Slaves. The distinctive personal characteristics of the different branches of the race as regards features and color, are well described

* Chief among these he mentions the old town of Kasan, to the north of Namangan in Farghana, where the inhabitants boast that they have occupied their present home for seven hundred years and that they successfully warded off the attacks of the Mongol Invaders of the thirteenth Century.

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by this traveller in speaking of these three classes, and may be briefly summarised as follows. The Descendants of the Persian Slaves (class 3), are without exception, of a rather dark complexion with black hair and are decidedly more dolichocephalous* than the Tajiks of class 2 (the Persian Colonists); among the latter individuals are occasionally, though by no means often, found with blonde or auburn (châtain) hair and even blue eyes, and their skulls, though longer than those of class 3, are decidedly less long than those of the Galchas and other aboriginal Iranians.—Among the Tajiks of class 1. (the Indigenous Iranians), brown or blonde hair with blue eyes is extremely common, in some localities even more so than darker shades, and as regards the shape† of their heads they are markedly brachycephalous.

Other writers, whose names are quoted as authorities at the end of this article, also speak of the Tajiks as obviously of Iranian race as regards features‡ and language, and describe them as of a good middle height with powerful frame and broad shoulders, and clearly distinguished from their Uzbak neighbours by their full dark beards.

The successive waves of Turkish and even Mongol population which have burst over the open country of Turkistan, have done much to modify the purity of race and distinctive Iranian type among the Tajiks of the plains, and sufficiently account for the differences already noticed between them and the Galchas of the remote and practically inaccessible mountain valleys, and it will be shown that the absence of uniformity in the language of these two chief divisions of the race is attributable to somewhat similar circumstances. The language of a people is a less safe guide in investigating the ethnological problems connected with them than are such physical characteristics as those recorded by Ujfalvy, but the evidence of the former cannot be disregarded, and in the case of the Tajiks points to the same conclusions as those arrived at from other sources. Before attempting to describe the dialects upon which this statement is founded, it may be well to notice the chief localities in which the Tajiks of the two classes are met with. According to Shaw the inhabitants of Kulâb, Macha, Karátigin, Darwaz, Roshan, Shighnan, Wakhan, Badakshan, Zaibak and Minján are all classed by their Turki neighbours as Galchas. To these may be added the inhabitants of most of the Begships of the Bukharan government of

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* A dolichocephalous skull is one the diameter of which from front to rear exceeds the transverse diameter. In the Brachycepnalous skull the transverse diameter is the longest.

† Ujfalvy gives tables showing the measurements of 75 Galcha heads and of many more of the other subdivisions of the Tajiks.

‡ The type of features prevailing among the diffirent sections of the Tajiks varies like the characteristics already noted, according to the degree of purity of the race; thus although the face of the Tajik of Samarkand or Bukhara is clearly of Persian type, and is more oblong than that of the Turk, it has more or le s of the thi k nose, large mouth and wider forehead of the later race. The hands and feet of the Galcha are similarly larger than those of the Tajik of the plains, which are again larger than those of the Turk.

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Hissar and of the small communities Fan, Falghar, Yagneb, Kishtút, Farap and Maghián which with Macha mentioned by Shaw, form the Russian province of Kohistan.*

The Tajiks of the plains form the bulk of the settled communities of Western Turkistan, and as we have seen are a more or less mixed race, those of Farghana approximating more nearly to the pure Galcha type than those dwelling in Samarkand and Bukhara. The language of the Galchas appears to be everywhere an almost pure Arian dialect, including however a few Turkish† words, probably derived from their commercial relations with the people of the plains, and, as is the case in all Eastern countries, a few Arabic words generally unchanged in form and probably introduced with the Musalman religion.—The structure of this language and the words by which the common necessaries of life are designated are generally held to show that it is derived from the same languages as the Modern Persian. Shaw with apparently good reason as regards the Galcha dialects of which he has collected vocabularies, repudiates the idea held by some philologists that they are an offshoot or corruption of Persian as spoken or written in historical times and believes that many of the words‡ collected by him have a closer connection with other Aryan tongues.

The dialects spoken in the Kohistan Begships, and probably in Karatigin, are apparently more like the modern Persian as spoken by the Tajiks of the plains, than are the dialects investigated by Shaw. The latter would certainly not be readily understood by a Tajik of the plains speaking only his own language, but Fedchenko says that the dialects of Kohistan "are more or less intelligible" to the Tajiks of Samarkand, and Ujfalvy, who however is a less reliable authority, says, that Tajiks and the Galchas of Kohistan can converse together quite freely. There appears to be no reason to doubt that the various dialects spoken by the Galchas are all varieties of one language and the differences between them are not greater than might be expected among an entirely illiterate people, from the secluded character of the valleys they occupy and the almost entire absence of intercommunication. The dialect of the Yagnab Galchas is frequently quoted by Russian authorities as an exception to this statement, and is said to be a language of an entirely different character and quite unintelligible to the other sections of the tribe. We have no vocabulary of this dialect except a very imperfect one in Ujfalvy's recent work on the ethnology of

* This Government includes all the Mountain valleys on the upper course of the Zarafshan and its tributaries from Panjkand to the great glacier in Macha which forms the chief source of the river.

† Mayef who although apparently no linguist has travelled much among the hill Tajiks, notes that the inhabitants of Darband were the only Galcha community met with on his journey to Hissar who did not understand the Uzbak (Turki) dialect.

‡ The tales in the Wakhi dialect translated by Shaw seems to show that it at least is derived from the same old Persian language as Pushtu, vide the form of the future and such expressions as Tarkum raghdái, whither has he gone, and many others.

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Turkistan, which by no means establishes the truth of this assertion.*

The Tajiks of the plains speak a language only differing from modern Persian in a few points of idiom and pronunciation.

The latter before the invasion† of the Mongols, was the language of the rulers of the country and of all classes who had any pretence to erudition or to the cultivation of literature or art,as well as of the Persian artificers who formed the bulk of the population of the cities of Bukhara and Samarkand. Its place was usurped during the 15th century by Chagathai Turki which under the auspices of the family of Timur became for a time the Court language and developed a literature of its own, comparing favorably even with that of Persia during its best epochs. Gradually however the Persian dialect appears to have re-asserted itself. The peculiar talents for business of all kinds possessed by the Tajiks rendered their services indispensable to the Turkish rulers of Turkistan, notwithstanding that the latter have very generally disliked and mistrusted them, and for the last three hundred years we find that most of the principal offices of state in Bukhara and Khokand have been filled by persons of this race, or by the still more disaffected Persians, and in the towns most of the trade and manufactures are in the hands of a class more or less Tajik in its origin. The ruling families of Turkistan are still entirely of the Uzbak race and Turkish is so far the court dialect, yet a knowledge of Persian is considered essential as a mark of refinement and erudition. It continues to be the language of diplomacy and all foreign relations with other governments are carried on in it, every Turkish official having a clerk by his side to write for him, who uses Persian as a matter of course in all official business.

Under these circumstances it is not difficult to understand how the Tajiks of the plains have abandoned‡ the less refined form of their language, which is still retained by the more remote sections of their tribe.

The Galchas are almost the only representatives of the race who form separate communities in Western Turkistan, and their ways of living differ in many respects from those of their neighbours in the

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* The numerals given by Ujfalvy differ little from those of other languages of the same class excepting that he gives Nau and Dass for seven and eight which seems likely to have been a mistake of his own. Other instances such as roukhchinie (sic) meaning day or daylight ; Sontour Kouchtime we will kill a sheep (?) ; Name, tchokh, what is its name ; koutte, a dog ; Nakhjir, a stag ; and many others appear to show that the dialect is identical in origin and not very unlike other Galcha tongues.

† Uzbak Turki was at this period the language of the country population, Persian, that of poetry, literature, diplomacy and trade, and Arabic, that of science and religion.

‡ The Tajiks of Badakhshan whom Shaw classes as Galchas are said to have abandoned their old dialect in favor of modern Persian during the last three hundred years. Forsyth also mentions that the people of Wakhan speak Persian as well as their own language, which is probably a step in the same direction.

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plains. Among other points noted by Ujfalvy, is the shape of the tent used by such of them as lead a pastoral life during a portion of the year. These are of great size and of an oblong form with flat tops, quite unlike* the dome shaped *Yurts* universally used by the nomads and semi-nomads of Turkistan. Their houses also differ from those of the Turks, being built of wood and rough stone instead of bricks and mud, the wood in many cases being handsomely carved. Their national beverage, corresponding to the kumis of the nomads, is called Airán, and is made of curdled goats milk mixed with water.

Their ploughs are entirely of wood, the sketch given by Ujfalvy showing that they are identical in form with those of Northern India, whereas the plough of Turkistan as figured in Khanikoff's work on Bukhara has a cast iron or steel ploughshare and differs in shape from that of the Galchas. As regards costume, the Galchas are dressed entirely in homespun materials, their head dress being a close fitting skull cap. Many of them are armed either with matchlocks with forked rests or with weapons of the character of a mace, but they are on the whole a peaceable race and not generally addicted to tribal feuds or to making raids on their richer neighbours in the plains.

Their ingenuity in road and bridge making is noticed by Lehmann and many more recent travellers. Their roads are generally only adapted for riding, but the manner in which they are cut along the steep hill sides or carried for long distances over beams inserted into the face of precipitous rocks shows considerable knowledge of practical engineering.

In the plains the Tajiks are generally found mingled with the dominant race, whose dress and customs they have more or less adopted, but even here they differ in many essentials as regards character, disposition and tastes from the Turki race. The latter, as mentioned in the introductory remarks† on the populations of Turkistan, still retain many of their nomad tendencies, are most at home in the saddle and averse to labour of any sort, while the Tajik appreciates his home comforts, dislikes fighting and is addicted to settled pursuits, such as agriculture, and especially commerce. He is more courteous in conversation, though probably less sincere and straight forward than the Turk, and he is more intellectual. Vambery does not hesitate to attribute the religious and moral supremacy of Bukhara over the neighbouring Musalman states to the numerical predominance there of the Tajiks who throughout the history of the Khanat as already mentioned have been employed indifferently with freed men and others of Persian race in most of the higher departments of government and generally in all employments entailing any consider

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* From Ujfalvy's description these tents must be much the same as those used by the Chadar Nishin population of the Kanaahar valley.

† See the Journal of this Institution for December 1878, No. 34.

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able mental acuteness. The Uzbaks in Turkistan while recognising the superior cleverness of the Tajiks look down on them as an inferior race,* addicted to cunning, avarice, want of sincerity and other vices opposed to the traditional Uzbak virtues, and they say that a slave would rather pass ten years in the service of an Uzbak than five with a Tajik, owing to the want of conscience in the latter.

All these charges seems pretty well founded, and the want of sympathy between the two races is probably increased by the absence among the Tajiks of national feeling, due partly to their commercial habit of mind, which led them to look favorably on the late Russian encroachments as likely to benefit trade. They are generally less fanatical than the Uzbaks, whose simplicity they in their turn somewhat despise.

Khanikoff describes the Tajiks of the Khanat of Bukhara as utterly vicious and immoral, and only restrained from crimes of violence by their abject cowardice. Elphinstone, whose acquaintance with the race was however probably limited to those inhabiting Afghanistan and the neighbouring hill States, writes more favorably of them, saying that they are on the whole a peaceable, orderly and sober people and by no means so cowardly or immoral as they have been represented.

Wood also in his journey towards the source of the Amu, describes the Tajiks he met with as pleasant companions, grave by temperament but fond of conversation, and their Mullahs especially friendly and tolerant. The Galchas or hill Tajiks contrast in many ways favorably with those of the plains. The rugged nature of the regions they inhabit appears to have developed an independent and manly spirit among them which has enabled them to maintain their independance for many generations against the races now dominant in the plains, and with the exception of the ancient state of Sarikol which was a few years ago overrun by the Kara Kirghiz we have no recent instance of any of these Arian communities having succumbed to the Turk invaders. Most of the Galcha States are governed by hereditary Princes, who in many instances claim to have descended from Alexander the Great.

The name Tajik is not often used by people belonging to this race when speaking of themselves, possibly from the contemptuous feeling with which they are regarded by the Turk races, and they prefer to describe themselves as Bukharans, men of Tashkand &c., according to the town to which they belong. According to the Chevalier Ujfalvy, there is no such sentiment among the hill Tajiks, who he says consider themselves honored by the name of Galcha, but other authorities treating of the dialects spoken by the race, say that on the upper Oxus

* On the other bank of the Oxus Wood says that the same feeling prevails, and that in Kunduz a Tajik is not allowed to marry an Uzbak woman, although there also their superior literary acquirements obtain for them a considerable share in public affairs.

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they are known as Wakhi, Shignani, &c., from the names of the States where they are in use, and Ujfalvy himself classes the Galchas whom he visited in the Russian Kohistan district as Fans, Machas, Kishtuts, Yagnabs &c., all of which are territorial rather than tribal appellations, and are derived from the names of the small states to which they belong; from which it may be inferred that there is no strong race* feeling shared by the various sections of the tribe.

In religion most of the Tajiks are Sunni Mahometans, and in Afghanistan very zealous ones, but seeing that the people in many of the more inaccessible valleys are Shiahs, while those of the open country around them are Sunnis, it seems not unlikely that the former creed may have been more extensively professed until forcibly repressed by a Sunni power, which in the case of Western Turkistan was probably the Uzbaks. In the remote fastnesses of Kafiristan the inhabitants, who are believed to be of the same stock as the Galchas, have never been converted from their original paganism, and even in the comparatively more accessible hill states of Western Turkistan traces of older superstitions have survived the introduction of the Musalman faith; thus Ujfalvy speaking of the Galchas of the Upper Zaratshan mentions that they evince a reverence for fire, which they never extinguish with their breath. Wood found the same superstition in force on the upper Oxus, where he observed that the Tajiks never blew out the rush-lights used by them for lighting their huts, but were in the habit of peeling, off a ring of the bark of the rush with its accompanying coating of bruised hemp seed, and of allowing it to burn out. They are also even in the Khanat† of Bukhara, addicted to strange practices, much opposed by the Mahometan priesthood, of passing sick persons over or round a fire, calling at the same time to the spirit supposed to be occasioning the disease, to depart to the deserts and lakes.

The derivations of the names Tajik and Galcha are matters of some doubt. Elphinstone quoting from Persian authorities says that the former is connected with the Persian word Tazi, and means the descendant of an Arab born in Persia, and this account of their origin, though otherwise improbable, agrees with their own traditions, and they are in the habit of referring with pride to their Arab extraction, asserting that they came from the neighbourhood of Baghdad. Vanbery, probably with good reason, considers that there is no truth in either the derivation or the tradition, but says that he has heard the word applied secretly as a term of reproach by Armenians in Asia Minor to Musalmans, whether of Turk or Arab origin, and believes that the word is a very ancient one, originally meaning an alien or person of a different religion. He also quotes, and to some extent supports, the opinion expressed by de Khanikoff that the word may be referred to *Taj*, the name given to

* In opposition to this view it may be remembered that all the sections of the Galchas now included in the Kohistan begship united in opposing the Russian advance into their country in 1870.

† Khanikoff.

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the old headdress of the fire worshippers. Both of the last authorities think that the fact, already noticed of the name being seldom used by the people to whom it belongs, points to its having been at one time a term of reproach or ridicule. Regarding the meaning of Galcha,* no explanation is hazarded by any of the above writers, but M. de Ujfalvy gives the following rather startling translation of the term, on the authority of the people themselves, "*Galcha* c'est à dire le corbeau qui a faim et qui doit se retirer dans les montagnes pour vivre."! The idea may be connected with the fact that a somewhat similar word in Persian is applied to a Magpie?

The term "Sart" is sometimes used, especially in Khiva and Khokand, where comparatively purely bred Iranian Tajiks are less common than in Bukhara, as almost synonymous with Tajik. Strictly speaking Sart is not a generic term, but is applied to designate a dweller in cities or settled habitations, as opposed to a Nomad, thus the Khan of Khokand in a Firman given to Fedchenko and his party, directs that neither nomads nor Sarts shall molest the party, showing that he considered all his subjects to be comprised under one or other of these titles The word is constantly used in this sense by the nomads to describe those that lead a settled life, not without the imputation, as in the French "Bourgeois," of the lack of certain of the nobler virtues. The etymology of the name, as given by Lerch, is extremely interesting. He traces it to *jaxartai* the name of a people described by Ptolemy as living on the borders of the nomad Turks. This word he believes to be from the same Arian root as the Sanskrit Kshatri and the Persian Shahr.

AUTHORITIES:—

Shaw; Ujfalvy; Khanikoff; Wood; Forsyth; Schuyler; Lehmann; Elphinstone; Lerch; Mayef; Vambery; Pundit Manphul; Fedchenko.

* Shaw spells this name Ghalcha.

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II.

THE ACHEEN WAR.

NOTES ON THE HISTORY OF ACHEEN.

The Acheenese embraced Islamism in the commencement of the 16th Century. Ibrahim Sultan of Acheen freed the country from the yoke of the Pedir Government, and in 1521 defeated the Portuguese fleet. After these events the Portuguese and Acheenese were constantly at war till the end of the 16th century, closing with the surprise and massacre of the Portuguese in their strong island-fort on the lagoon north of the Atjen-river. In the begining of the 17th Century the Dutch first established a trading settlement in Acheen, but after a time abandoned it. By the middle of the 17th Century the Dutch had completely expelled the Portuguese from the Indian Archipelago, and had made themselves masters of the Eastern seas and islands. It was in 1651 in consequence of the murder of some Dutchmen by Acheenese that hostilities ensued between the Dutch and Acheenese and all further friendly intercourse between them, except for short intervals, may be said to have closed from that time.

Acheen Proper was divided in 1675 into three districts called the XXII, XXV, and XXVI, "mookims" or parishes, and to each a chief was appointed. Each mookim had its "Missighet" or parish church, the destruction of which in war was regarded as a great disaster. Since the division of the land the heads of the three districts have constantly been at war with one another. According to the Dutch accounts, nothing could exceed the venality of the Acheenese rule. They state that the Sultans, after nominating a Rajah or chief to each of the petty states along the coasts of Acheen on the death of a ruler, were always open to bribery from other claimants. This led naturally to endless wars; as the claimant armed with the authority of the Sultan, collected his followers and disputed possession with the previously acknowledged heir. The last Sultan of Acheen died of cholera in 1874, and his son was elected his successor by the chiefs of the mookims, but owing to the Dutch being in possession of the Kraton the capital of Acheen, the young Sultan's installation was informal, and being quite a lad he was of course a nonentity.

Acheen which has been a power in the east, began to wane in the 18th century, and the influence of the Sultans, who are said to have once had a fleet of 1000 ships at their disposal, to gradually diminish, and during the present century civilization has passed the century by. In proportion as the power of the Sultans diminished that of the Mahomedan priests increased. Nearly all the fire arms of the inhabitants were those of 100 years ago; and their schooners and prahus were also of ancient date.

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The Acheenese of the present day have a language of their own and are a race of themselves; probably originally descended from Malays, they have received Budhists from Hindustan, then came the Arabs, and since Klings and others, thus the present race is a great mixture. In Acheen Proper the inhabitants are fearless looking, light complexioned, fairly powerful men, rather above the middle height. On the north and east coasts, the Arab type prevails, aquiline noses and darker complexions; whilist on the west coast they are short and thick set, and more of the true Malay.

The Acheenese were professional pirates; and the list of their depredations of late years, is a long one. No nationalty was respected; and these daring robberies threatened to paralyse commerce in the Straits Settlements. The "Penang Gazette" of the 25th October 1872 thus expresses itself on this matter. "If the whole of Sumatra could be made amenable to some of the leading laws of advanced humanity, there must ensue a termination to disgraceful piracy and murder. Why should we recapitulate the complaints of ship masters, ship owners and seafaring men? Acheen must be humbled. The nauseous pride and studied insult with which the Acheenese have treated the British and other royal navies must be summarily dealt with and disposed of. We understand that the Dutch have determined to undertake the humbling of these insolent rascals, and we wish them every success"!!

Cause and origin of the Acheen War.

A small nation like the Dutch cannot receive too much credit for having prosecuted the war in Acheen under so many and great difficulties, although some of their political moves are opposed to our ideas of right and wrong. For many years they had been working gradually up the East coast of Sumatra, till, having taken in succession the states of Delhi and Langhat on the East Coast 200 miles from Acheen Proper, public attention in our Straits settlements was in 1865 attracted to their enroachments, Delhi and Langhat having once been part of Acheen. The Dutch had all along kept in view the acquisition of the East coast of Acheen, from Diamond Point southwards known as the "pepper coast;" but owing to a treaty with England, they were debarred from making war against Acheen.

The misdemeanours of the Acheenese, and the Sultan having in reply to England's remonstrance regarding piracies, stated that he could not control them, showed the necessity of a war being undertaken, and during 1870-71 the requisite arrangements were come to between England and Holland, the former relinquishing her claims to Sumatra whilst the latter gave up her rights on the west coast of Africa.

The protection of Great Britain having been removed from Acheen, the Dutch were anxious to set about the war as quickly as possible, and hurried on hostilities with unseemly haste; never anticipating the stubborn resistance that they have met with from the Acheenese. The

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first object was to obtain a casus belli, and this was brought about thus. One Pangliman Teeban who had obtained a high position in Acheen, arrived in 1872 at the Dutch settlement of Rio, and presented to the Resident a treaty with the seal of the Sultan of Acheen attached, proposing to settle better terms with the Dutch Government. The Sultan afterwards repudiated this treaty stating that it was a forgery; and the Dutch next hearing that the Americans were being invited to step in between them and the Acheenese, decided on sending an ultimatum to the Sultan demanding an explanation—Haji Abdul Rachman prime Minister to the Sultan, a man of great ability and influence, and whose previous life had been a most remarkable one, was able to have his own way in the determination to fight it out with the Dutch. The Sultan's reply to the ultimatum was not satisfactory, and accordingly the Dutch declared war on the 26th March 1873, and their men-of-war at once opened a bombardment. The petty Rajahs of Acheen apparently had no participation in the action of the Sultan, and were ignorant of the circumstances which brought about the Dutch invasion.

Sketch of Acheen War 1873—1877.

The Acheen war is divisible into three distinct periods.

1st Period.—From commencement of hostilities in March 1873 to the return of the "First Expedition" on the 9th May 1873.

2nd Period.—From the commencement of the "Second Expedition" in November 1873 to the capture of the Kraton on 24th January 1874.

3rd Period.—Which may be called the war of annexation from the Spring of 1874 to the present day.

The routes taken by the Dutch troops in each expedition are shewn on the map by dotted lines, starting from the points of debarkation, where the dates are noted.

1st Period.—The "First Expedition" started from Batavia on the 22nd March 1873 under the command of General Major Köhler, and arrived off Olehleh early in April. The force consisted of 10 guns and 8 mortars, 60 cavalry, 135 Engineers, 2755 infantry in four battalions half armed with breech—loaders, and a proportionate number of Intendance, Medical, and other departments. The force was conveyed in 11 transports, escorted by 6 men-of-war, and 9 smaller war vessels. Other islands in the east had been conquered by small forces with ease, and no doubt was entertained of success attending this imposing fleet.

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On the 6th April four companies landed and made a reconnaissance and re-embarked the same day. Next day no measures were taken owing to a gale, but on the 8th April a disembarkation was effected at a point near Olehleh. The landing was vigorously opposed by the Acheenese, who rushed into the water sword in hand, to attack the troops as they got out of the boats.

On the 10th April the main body advanced and encamped at Mardeohati, whilst a reconnaissance of one battalion reached the great Missighet on the north side of the Kraton or Kotta Radja, and drove the Acheenese out, but evacuated the position the same night. The troops remained massed at Mardeohati till the 13th sending out a reconnoitring party of a battalion, during which time the Acheenese sallied out of the Kraton in force, re-occupied the Missighet and attacked the Dutch bivouac.

On the 14th the Dutch re-took the Missighet after severe fighting; General Köhler being killed, and 250 of all ranks killed and wounded. Reconnaissances of entire battalions were sent to the east and north, but owing to the dense jungle which then surrounded it were unsuccessful in finding the capital of Acheen, with the exception of one young officer, who entered it from the north side without knowing that it was the great Kraton, and discovered the Acheenese in full flight.

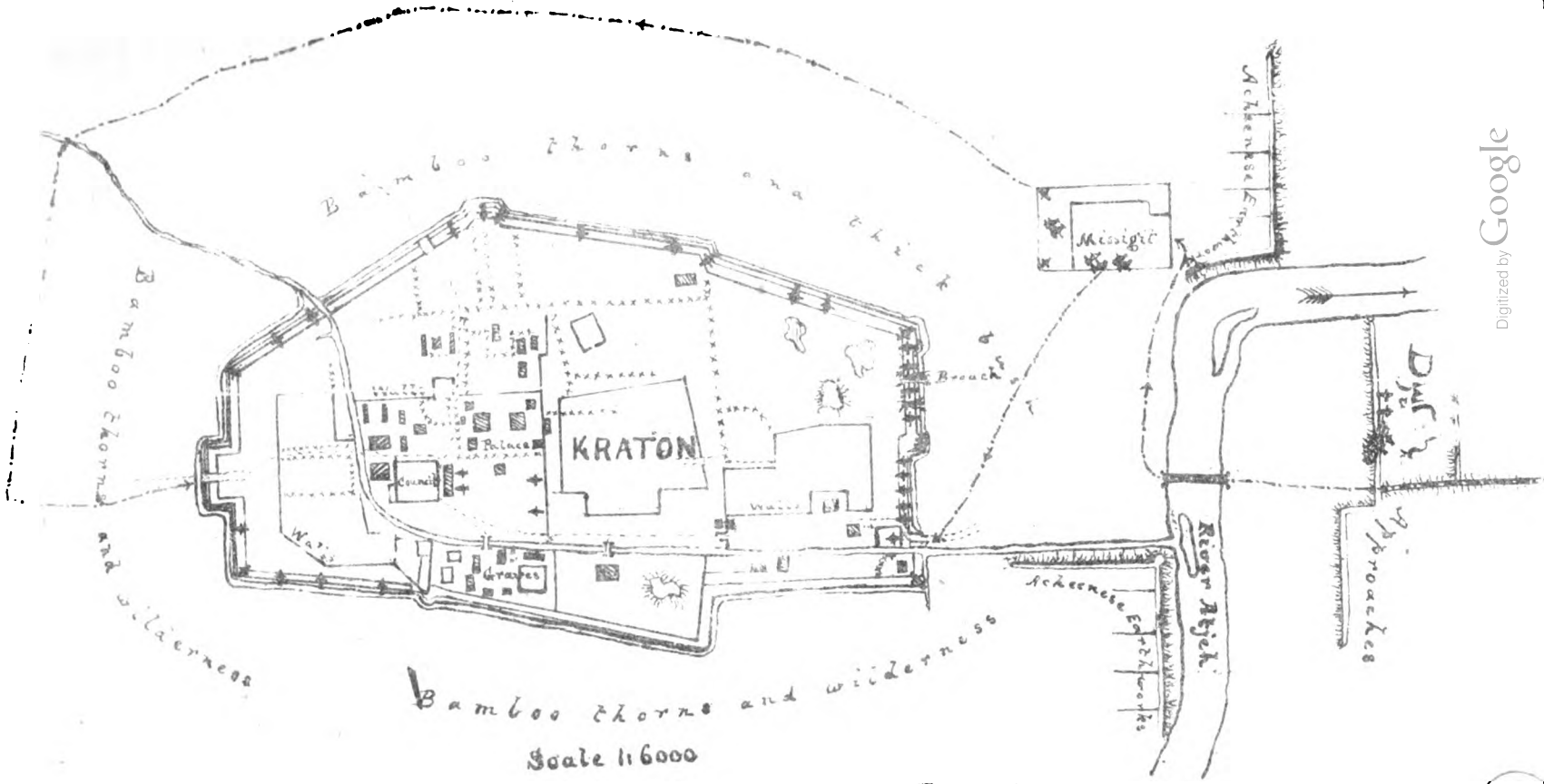
The Officer who succeeded to the command of the Dutch on the death of their Chief, was evidently unequal to the situation. He held a conference with the Naval Commander, and came to the conclusion that, as unfavourable weather was probably impending which might sever communication between the fleet and the shore, and as the force was not strong enough to hold its position, it was most expedient to evacuate Acheen. Accordingly all the troops returned to the coast, re-embarked on the 29th April, and proceeded back to Batavia.

It was since discovered that if instead of retiring the Dutch Commander had pushed forward, he would have found the Kraton deserted, as the Acheenese had decamped, and were miles away. The Naval Commander's fears of being unable to communicate with the shore also proved to be totally groundless. A full enquiry was made into the cause of failure, and these two Officers were retired. This fatal evacuation of the country has had much to do with the prolongation of the war, by buoying up the Acheenese with the hope that, as they once drove the Dutchmen into the sea, there is no reason that they should not do so again.

The Dutch losses in this expedition were 6 officers and 77 men killed, 28 officers and 393 men wounded, and 1 officer and 5 men died from sickness. Much of the loss was occasioned by the Acheenese being able to make good their favourite attacks with the Klavong or short sword against the troops armed with muzzle loaders, and creating a "Klavong panic" which has not yet been eradicated.

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No 1. Attack on the Kraton, Jan^ry 74.

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2nd Period.—Before entering on further military operations, a letter proposing suitable terms was sent to the Sultan by the hands of two Javanese emissaries. One of these was murdered, and the other is still supposed to be a prisioner in Acheen.

In November 1873, as soon as the favourable monsoon had set in, a second expedition under General Von Swieton left Batavia and anchored off Olehleh on the 8th December. The force divided into 3 Brigades consisted of 74 guns 300 engineers, a troop of Cavalry, 6,500 infantry, and a corresponding proportion of the staff departments. A strong fleet of 18 men-of-war and numerous armed boats escorted the transports.

The Acheenese who had increased their defensive works along the shore, assembled in great strength to resist the landing, but were out manœuvred by the transport ships steaming eastward during the night; and a debarkation was effected without opposition on the 9th December near Lamgah. On the 12th an advance was made south west along the coast, on the 13th Moesapi was reconnoitred and the following day the Acheense were attacked and driven out of Moesapi and Kotta Radja Bedil. The Dutch occupied the old Portuguese fort on the island near Moesapi until the 20th, and then advanced and captured the position at Penajong; a simultaneous advance having been made by boats up the Atjen river.

The advance from Penajong southwards assumed more the character of siege operations and occupied considerable time, owing to the construction of parallels and covered ways, which the Dutch found it necessary to throw up in order to escape the heavy fire which the Acheenese poured in from their earthworks on the left bank of the river. A bridge had also to be thrown across under a galling fire.

On the 6th January 1874 the force crossed the river and, for a third time, assaulted and captured the great Missighet, after hard fighting, and a loss of 223 men killed and wounded.

Sketch No. 1

On the 12th the main body moved south and to the west of the Kraton, and Kotta Petgoet, a massive block of masonry 300 yards south-west of the Kraton, and a favourite resort of the Sultans; and on the 24th a combined attack was delivered against the Kraton from the north and south, after a bombardment from the captured Missighet and from batteries on the right bank of the Atjen river. It was found that the Acheenese had fled, fearing that their line of retreat to the east would be intercepted.

The result of the capture of the Sultan of Acheen's capital was, not unnaturally perhaps, much over estimated. Great were the rejoicings, and the news was telegraphed home with the announcement that the Acheen war was over!

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The Dutch losses in the second expedition were 14 officers and 134 men killed, 65 officers and 699 men wounded, and 14 officers and 890 men died from sickness.

The annexed sketch No. 1 represents the positions of the contending forces in the final operations against the Kraton.

3rd Period.—After the capture of the Kraton, Genl. Von Swieton appears to have quite made up his mind that, if he only remained quiet long enough, the Sultan and all the chiefs would of themselves come in and sue for terms.

Accordingly he recalled a force of 2000 men which had pushed forward eastwards and had found the country clear, and contented himself with placing posts along the lines of communication with the coast. In three days the Acheenese returned and commenced a line of earthworks to the east and south east of the Kraton.

After several days inaction General Von Swieton sent out parties to fasten up proclamations on trees, enjoining the Acheenese to submit to the Dutch &c. &c. One of these parties lost 7 officers and 70 men killed and wounded while putting up three copies of the proclamation. When Acheenese prisoners were taken, each received a present of a dollar, and was set free. Such misplaced philanthropy only brought the Dutch into contempt. Force was the only thing that the Acheenese could thoroughly appreciate, and General Von Swieton's line of action and inaction was looked on as a sign of weakness and inability to enforce his terms. With the fine force at his disposal, the Dutch General might have followed up his success of the 24th January and marched with ease all over the valley of Acheen Proper. The result must have been its speedy subjugation, leaving the petty states along the coasts to to blocaded and dealt with in detail.

In 1874 the whole of the ports of Acheen were blockaded by the navy and closed for trade, the immediate effect of which was the production of quite a reactionary feeling in the Malacca Straits, where speculators in pepper saw ruin staring them in the face with no hope of recovering advances previously made to the growers in Acheen. The continued out cry of the straits settlements merchants regarding the ruin to trade that the blockade was affecting, induced the Dutch to re-open some of the eastern ports of Acheen as also Pedir and Giegan on the north coast. So long as only a few ports on the east coast were opened, there was not much harm done, the distance being too great from Acheen Proper for the conveyance of rice inland, the exclusion of which was chiefly aimed at; but opening any ports on the north coast was a fatal blunder, they being so close to Acheen Proper, and the chiefs and people being themselves eager for war. In fact it would have tended to bring affairs to a conclusion much sooner, if the blockade of every port in Acheen had been strictly maintained till the people submitted. No sooner was the port of Giegan opened, than it was used

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for the purpose of importing contrabands of war; and this coming to the knowledge of the Dutch, the port was again closed. The port of Pedir was likewise used for importing supplies and war material during the three years preceeding 1877, when measures were taken to stop this by sending a force of a Regiment and 2 guns to establish a fortified post at Sigli near Pedir.

In April 1874 General Wigghers Von Kercham succeeded General Von Swieton in the command of the forces in Acheen, then mustering under 4000 of all ranks. He devoted himself chiefly to arranging for better hospital accommodation, improving communications by road making, and forming out-posts from Longbatta south to Sinangri, which completed with the posts previously established on the north-east a fair line of circumvallation round the head quarters at the Kraton.

The hope that the Acheenese would sue for peace now proved abortive, and it became necessary to prosecute the war. The transport and means at the disposal of the Dutch certainly rendered an entrance into the heart of the country over the hills on the west coast a hazardous undertaking, the difficulties being considerable and the water supply reported as insufficient; but every thing appeared to be in favour of an advance from the north coast, where the average height of the hills is under 1000 feet, the gradients easy, and the water supply plentiful; moveover there are fine bays in which ships can ride close to shore for the base of operations. From Pedir working up the river, and from Kroen Radja adopting the paths by which the Acheenese received their supplies, are the lines of advance that naturally suggest themselves. An intrenched camp on the hills might have been formed for a small army of observation, and as few men as possible left in the pestilential valley of Acheen Proper.

General Wigghers Von Kerchem was succeeded by General Pel, whose system was to conquer the country by pushing forward the line of occupation, and holding the captured territory by outposts. The force at his disposal was soon found insufficient, so reinforcements had to be sent from time to time from Batavia, until over 10,000 troops were in Acheen. This force should have been able to garrison the Kraton and other necessary posts, and send one or more columns forward for the subjugation of the rest of the country; but unfortunately they were frittered away in holding extended lines and inner lines of stockades.

In January 1875 General Pel made a successful expedition round the hills to the west and south of the Kraton, returning by the south-east, and although the acquisition of so much more conquered territory caused a strain on the Dutch Army, yet the prompt and vigorous measures that distinguished all General Pel's operations regained for the Dutch a good deal of lost prestige. At every point he was successful, and proportionately dreaded by the Acheenese. His greatest mistake was the establishment of the south-east line of posts from the

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southern hills to Lambaroe, as the line protected nothing and was a source of weakness; moreover the services of 1,400 men needed to hold it, may be said to have been wasted.

On his second expedition in February 1875, to the east and north along the line of outposts, General Pel died suddenly of heart disease. He was succeeded by General Kerchem, who went out with a force in September 1876, and threw the left flank of the north line of outposts forward as far as Kliang and Kadjoe, after some severe fighting. General Diemont soon after superceded General Kerchem as he was not considered self reliant enough for the command.

The experience gained in the last three years had made it clear that, to attempt to continue the former aggressive policy of an advance *foot by foot*, as it may be said, through the valley of Acheen known as "Great Atjeh" was impossible; for as the line of posts was pushed forward, it became necessarily much lengthened, and would eventually have entailed the employment of a larger force to hold the captured territory than the land itself was worth, and than the Government had at its disposal, besides prolonging to an unlimited extent a war that can so far be said to have had but few satisfactory results, owing to the obstinate resistance of the Acheenese, and the very great difficulties that had to be overcome in the nature of the country fought over, added to a climate that appears to undermine the strongest constitutions.

Great Atjeh is devoted almost entirely to the cultivation of rice; it is dotted over with thick clumps of trees, chiefly the cocoanut, and extends south-east for about 30 miles from the port of Olehleh. It is in the hills which run along the north east and west coasts that valuable products, such as pepper and betelnut, are found; and it was for the possession of these rich tracts of coast line that the war had mainly been undertaken.

The Dutch policy now was to establish a number of positions along the coasts, so as to command the several ports and possible landing places, it being known that the Acheenese have always been dependent on imports for the necessaries of life, as even rice cannot be grown in sufficient quantities in the country for the wants of the inhabitants.

A force left the Kraton in the last week of January 1877 with the object of establishing a line of posts along the north-east coast; after which it was intended to undertake the conquest of Samalangan, where considerable resistance was anticipated. The fleet was posted along the coasts to blockade between the Dutch stockades, and it was hoped that by these means the Acheenese would be brought to terms, or at any rate that the better disposed amongst them would be induced to resume their pepper trade, which had been paralysed by the war, and to conduct their trading operations through certain open ports which the Dutch would establish. Before the expedition started to

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establish these posts along the north-east coast, it was considered desirable to complete a direct line of posts to the north coast in prolongation from Kadjoe. This was done in the last week of January 1877 by the despatch of two columns by sea to Kroen Raja and Qwalla Loe, the former consisting of about 500 Infantry and a couple of guns under the Chief of the Staff, and the latter consisting of about 1,100 Infantry and some guns under Colonel Vander Heyden, the whole being under the Commander-in-Chief, who remained on board a ship off Qwalla Loe, and from there sent his orders from time to time.!

The Qwalla Loe column embarked on 6 steamers on the 25th January and the following day landed at Qwalla Loe without opposition, the Acheenese leaving their defences and retiring inland. The column selected a suitable bivouac near Nahun, and spent the night, and on the following day a reconnoitering force sent in the direction of Lambaroe Angan met with some opposition. On the 28th it was resolved to attack the fortress of Lamgah, and the necessary dispositions were made; but the Acheenese abandoned their defences on the approach of the Dutch from fear of their line of retreat being cut off, and thus the fort was occupied without resistance, and a garrion placed there. In the meanwhile the other column had landed at Kroen Radja on the 26th January and marched over the hills via Ladong to Lambaroe Angan without opposition, the villagers on the way flying with their property on the approach of the force. On the 28th reconnaissances were made from Lambaroe Angan and the Acheenese were felt in the neighbourhood; but before a plan for attacking them and taking their defences in rear could be carried out, orders were received for the column to join the Qwalla Loe column, and accordingly the Chief of the Staff marched his force to Nahun; and on the 29th the two columns were united at Lamgah.

The whole force proceeded southwards the following day to attack the stronghold of Lambada, where the Dutch had met with a reverse the previous year. On the approach of the columns a heavy artillery fire was opened from Lambada fort; and whilst the Dutch guns supported by the Qwalla Loe column engaged the fort on the east side, the Kroen Radja column worked round to the south and sent forward a storming part of Africans. These experienced some difficulty in their advance, as the fort was surrounded by a dense bamboo entanglement, in getting through which they suffered a little; but pushing forward rapidly, the Africans entered the fortress just as the Acheenese were abandoning the place without attempting any further resistance, and flying in a northern direction.

The next day Lambada fort was left with a garrison of one company and a unsuccessful attempt was made to capture Meyroo, a large intrenched village a few miles south-eastward; after which event the columns returned to the Kraton. The results of this expedition were considered very satisfactory notwithstanding the repulse before Meyroo,

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for a good line of country had been annexed, and two fortresses and 54 guns captured, with a trifling loss of 33 killed and wounded.

In the course of a few days the Acheenese delivered a determined counter attack against the southern extremity of the Dutch line of outposts. The post of Biloel South and its two blockhouses were commanded by the adjacent hills forming a very weak position, especially on a flank: and must have been selected in the belief that the Acheenese would not attempt to mount guns on the heights above. Each blockhouse was on the summit of a low hill, and unprotected by earthwork or stockade, with one gun near each block-house, also unprotected. The Chief of Samalangan, who was now in the XXII Mookims with the Acheenese, appears to have realized the weakness of this extremity of the Dutch line, as his men broke through between Biloel North and Biloel South, cutting off the communication and getting in rear of the posts. The stockade of Biloel South and the block-houses were bombarded for seven days, and 50 men of the Dutch were killed and wounded. The guns near the block-houses could not be served owing to their exposed positions; and the garrisons ran short of ammunition.

To relieve these besieged outposts a force of 4 companies and 4 guns was sent off from the Kraton under Colonel Vonder Haifden a distinguished officer. After reconnoitring the position a storming party of 175 men was sent into the hills on the night of the 12th February 1877, and making a detour by the east, arrived at 5-30 A.M. within 50 yards to the south-east of and overlooking the rear of the Acheenese position, without being observed by the sentries who were all asleep.

Sketch No. 2

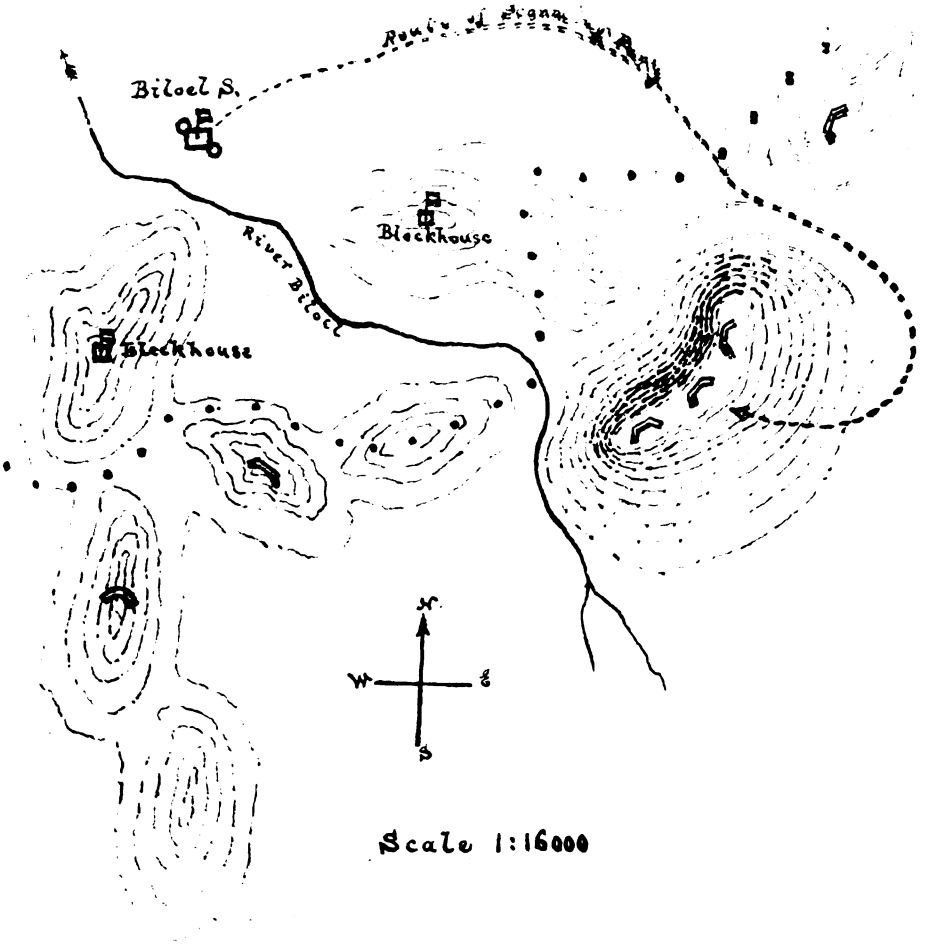
The surprise was complete; as, after receiving two volleys from the advanced guard, the panic-struck defenders abandoned the position, leaving 3 guns, 4 wall pieces, and a quantity of firelocks and swords. The attack was covered by 8 guns and the remainder of the battalion placed between Biloel South and the block-houses. The Dutch troops suffered no loss, but out of 175 men of the storming party, 104 were next day admitted into hospital; all Amboynese, the best men in the Colonial Army.

The following month the Acheenese made another attack in this quarter, attempting the capture of Atoeh by surprise at night; but they were beaten off by morning with the loss of 8 killed.

At this period the Dutch troops suffered a good deal from sickness the total number laid up in hospital being about 2000, nearly 25 per cent of the force in Acheen.

The Governor General of Netherlands India arrived in Acheen in February on a week's visit, to see the country, and inspect the principal positions and settlements on the east coast of Sumatra on his way back

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Achenese Sentries.

Batteries

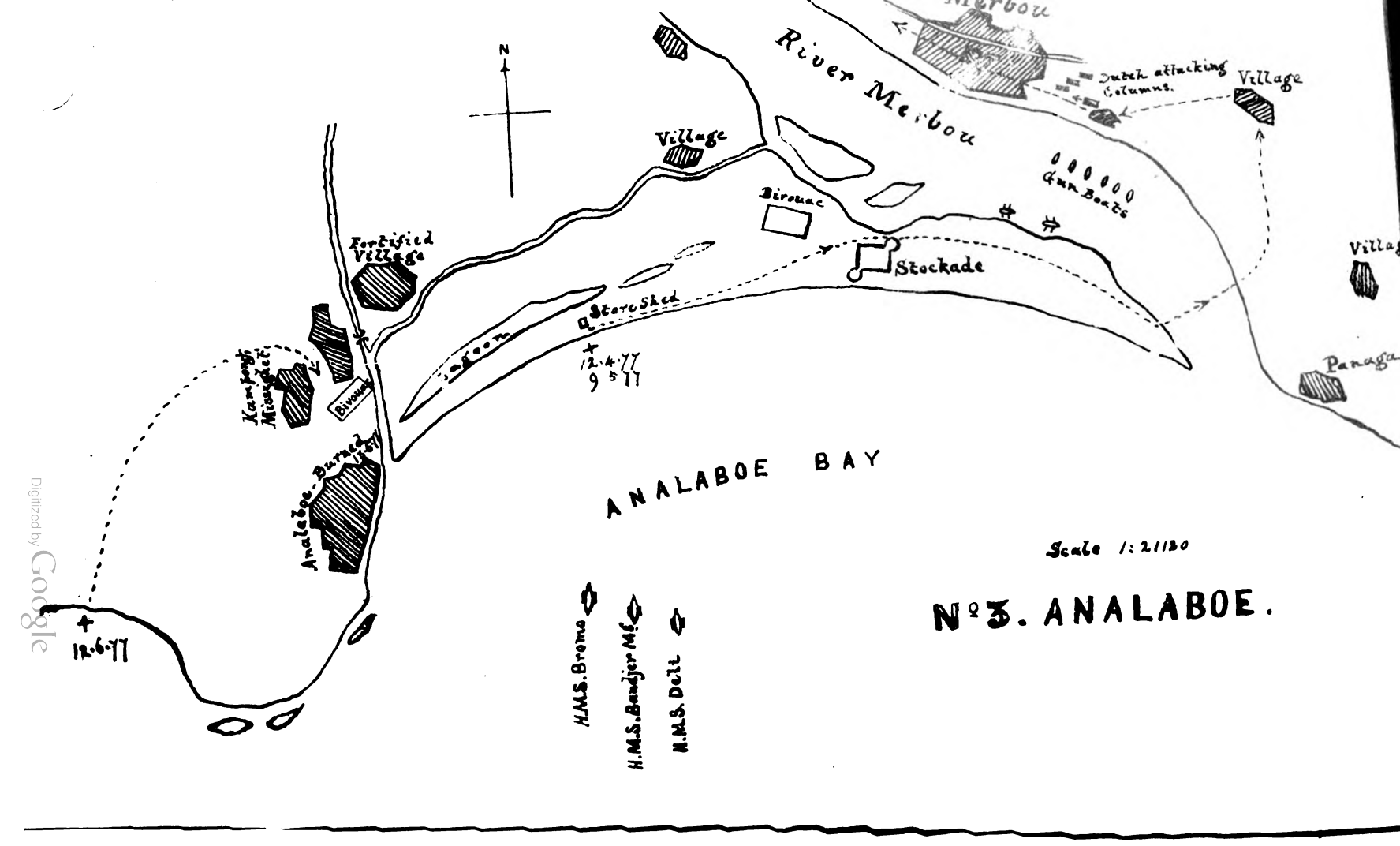
Dutch Posts.

No 2. Relief of Biloel South. 14.2.77.

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Nº 3. ANALABOE.

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to Batavia. On the day he left the Kraton His Excellency held a Durbar for the Chiefs of that portion of Acheen which had submitted to the Dutch, with the object of giving them the assurance of the good intentions of the Netherlands Government towards Acheen and the adjacent States ; and as a proof of friendliness, the great Missighet near the Kraton which had been destroyed by the Dutch troops was ordered to be rebuilt. This, and the assurance that the belligerent chiefs would retain their positions if they submit, it was hoped may have the effect of inducing some of these who were tired of fighting, to sue for peace. The Durbarees, some 18 in number, were much impressed by the ceremony ; but the Durbar was not altogether successful, as the most powerful of the subjected Chiefs, those of Edie and Pedir on the east coast, refused to attend, making various excuses.

The chief difficulties in the way of reducing these chiefs of Acheen to submission appeared to be the little trust they placed in the promises and agreements made by the Dutch, and that those who were disposed to submit feared being attacked in revenge by the neighbouring Chiefs still hostilely inclined towards the Dutch. A good number of those who had gone through the form of submission having done so for the sole purpose of having their ports opened.

The Rajah of Analaboe 100 miles down the west coast having requested that a post be established in his territory, an expedition consisting of 150 men and a couple of guns started from Olehleh on S. S. " Marion," and landed at Analaboe on the 12th April. A position for a stockade was selected and the troops bivouacked while it was in course of construction. The Rajah explained that his influence only extended to the south of the river Merbon, and that the inhabitants to the north of that river were unfriendly and warned the troops to be prepared for an attack. All went well for a fortnight, although the bearing of Acheenese, who frequently visited the bivouac, was almost insolent.

It had been necessary to place a guard of 11 men at a point on the coast 1400 yards west of the stockade for the protection of stores landed there; this guard was surprised at midnight by the Acheenese, the whole killed or wounded and their arms and ammunition carried off. This disaster was entirely owing to carelessness on the part of the guard. The sword wounds on the mangled bodies produced what the Dutch called the " Klavong panic" amongst the Java men in bivouac, so much so that they could not be brought to stand before inferior numbers of the Acheenese.

It therefore became necessary to send additional troops to reinforce the timorous garrison, and burn the village of Merbon which contained the chief offenders. Accordingly two companies under Major Von Dompselar were sent from the Kraton, disembarked the next day, and assisted by 2 gun

Sketch No. 3

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boats attacked and burnt Merbon on the 11th May 1877. The north bank of the river was thronged with Acheenese, said to be 3000, but probably not more than a tenth of that number, their only fire arms were the 11 rifles taken from the Dutch guard, and a few old smooth bores. The force on landing proceeded to the stockade and from there marched down the right bank of the river and crossed from a point lower down; then forming four columns advanced in echellon on Merbon, which had been shelled by the gun boats and from the stockade. Firing the houses enroute, and the Missighet, the African advanced guard passed on to the confines of the village; when hearing a sharp fire in rear it hastened back only in time to find the naval Brigade section driven back, and the Acheenese fled. It appeared that some 25 Acheenese, who had been concealed in one of their extraordinary false bottomed shelter trenches a few yards from the Missighet, had attacked and driven back the blue jackets; when hearing the cheer of the Africans making a counter attack they turned and fled. The Africans have established such a wholesome dread by their elan and ferocity, that the Acheenese fear them even more than they do the white faces!

The destruction of Merbon was effected with a loss of about 70 or 80 to the Acheenese; and this punishment had the result of inducing the chiefs of the surrounding villages to offer their submission.

Major Von Dompselar's troops returned to the Kraton the following day. The next expedition undertaken was against Loong 25 miles south of Olehleh a dependency of the Rajah of Lapong, who had gone through the form of submission and had received the Dutch flag and a warrant of confirmation in his position of chief under the Dutch Government; but as an instance of how nominal was the influence that these Rajahs possessed over their so called dependencies, news was received that a pirate praho of Loong had attacked a Chinese vessel, trading with proper authority on the west coast. Accordingly a battalion and four men-of-war were despatched to bring the Loong people to reason. The vessels were able to anchor within easy range of four small forts, which they shelled effectually, so the troops on landing suffered no loss and burned seven villages with the result of inducing the chiefs of the whole district to make their submission. The effect of this success was quite local; the general feeling amongst the people of hatred to the invaders remaining unchanged, and only to be eradicated by time and successful administration.

About the same time that the natives of Loong were being brought to their bearings, a similar expedition consisting of 400 infantry and two field pieces under command of Major Meijer was despatched to reduce to submission the chiefs of Langsa, the most southern territory on the east coast which acknowledged the rule of the late Sultan of Acheen. The troops disembarked and after a 12 hours march through mud and morass a fort was taken with a loss to the Dutch of 4 wounded. Five soldiers and 8 coolies died from the effects of the very trying

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march under a scorching sun. The troops had to cross a stream under fire up to their necks in water, to reach the fort, in which 5 Acheenese were killed and 8 wounded, the remainder having fled. When the troops were about to proceed against the adjacent villages the Chiefs came in and tendered their submission.

Shortly after the withdrawal of Major Von Dempselar's force from Analaboe, the chiefs who had tendered their submission threw over their allegiance and proceeded to fortify themselves, and an escort of 30 soldiers returning from the stockade one evening to embark, was attacked and four of their number cut down. It because necessary therefore to despatch a force from the Kraton, 500 strong with 2 guns to restore order. On the 12th June at 3-15 A.M. 200 infantry were silently landed by the boats with the object of attempting a surprise, but on reaching the Kampong Missighet where the chief delinquents were supposed to be it was found the enemy had flown. The remainder of the force came up from the ships and a bivouac was formed near the Missighet, and protected by a wire entanglement. For the first two nights there were constant alarms, and almost incessant firing. The Rajah of Analaloe took fright the following day and fled, and that night the Acheenese set fire to his house and the village of Analaloe, with the hope apparently that the flames would spread to the bivouac. However, a favourable wind saved the bivouac, but Analaloe the principal sea port town on the west coast was reduced to ashes and the object the Dutch had in view in placing a post there was completely defeated. It will be long before any trade can be re-established. A strong force will have to be retained at Analaloe for some time to come, until the hostile feelings of the inhabitants have completely subsided.

Simpan Olim on the east coast heretofore looked on by the Dutch as rather a settled territory, now became the scene of fighting. The Dutch settlement was attacked on the 20th and 29th June; on the former occasion the Dutch were taken by surprise and 8 Acheenese succeeded in entering the stockade and killing 1 officer and 3 men, and wounding 10 men. Seven of the Acheenese were killed and one made prisioner, who confessed that they and 300 others had been bribed to make the attack by the old Rajah of Simpan Olim an influential and wealthy chief who had been deposed by the Dutch 7 months previously, and was now trying to get his own again. The Dutch therefore determined to operate against the old Rajah, and despatched a force which arrived off Simpan Olim on the 7th July and was conveyed by the "Boni" a keelless river steamer drawing only 4½ feet water to Blangni stockade; next day the troops marched with 50 men of that garrison to Groong Groong where all the available forces from Simpan Olim and Samanto were massed, making a total force of 700 with 2 guns. The column then proceeded westerly to the Jamboo Ayer river and in the forenoon came into action at 600 yards with the old Rajah's Banting across the river. The Dutch and Acheenese were never closer

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than 200 yards, which accounts for the former only losing 1 Officer and five men wounded. In this action the Dutch troops had no cover and behaved very steadily under fire, during the trying time they were kept waiting before the advance was ordered. The Acheenese who were armed with Beaumont rifles and were concealed behind trees, felled timber, and their stockade, kept up a heavy fire. The heat was unbearable and knocked over many European soldiers, who had been 9 hours under arms. As soon as a raft could be constructed, made by lashing 4 country boats (" dug-outs") together and placing planks from an adjacent house on the top, the troops were crossed over ten men at a time. On assaulting the stockade and Rajah's banting, both were found deserted. The stockade was a single face, 500 yards in length of a double row of logs 10 feet high, with a ditch 10′ × 10′ on the west side, and connected the inward bends of the river. It was evidently constructed to resist an anticipated attack from the west.

It was clear the Rajah had been taken by surprise, as on entering his house all his possessions were found in confusion ; jewellery, gold, dollars, and other valuable property were seized, as also a large quantity of ammunition, including 259 kegs of English gunpowder. The troops bivouacked there that night, and next day reconnoitered up the river destroying the houses along the route.

Before leaving the Rajah's banting, the gunpowder, some 4,000 lbs, a part having been given to the friendly Acheenese, was collected under the Rajah's house, which was fired, a quantity of petroleum found on the premises having first been freely sprinkled about; the result was that in a few minutes a great explosion took place, the smoke ascending some 1,500 feet. It was seen and heard for many miles in every direction and had such a salutary effect, that another Rajah whom the Dutch meant to attack on the 13th July in his fort near the mouth of the Jamboo Ayer river, came to Blangni stockade, to give in his submission and asked for the Dutch flag. This was particularly fortunate as a man-of-war's sloop, in attempting to enter over the bar at the river's mouth the day previously, capsized and 3 of the crew were drowned; so considerable difficulty might have been experienced in getting the troops to the fort in question.

Any attempt to march from the shore inland is hopeless on the east coast of Acheen, as from 4 to 6 miles from the sea the country is one vast lagoon, which emits a most offensive effluvium at low water. The sea at one time apparently reached as for as the line of Dutch stockades, but bars have been gradually formed across the mouths of the river by their scour, and the land is gradually gaining on the sea. The reverse seems to be the case on the west coast of Sumatra, as where the iron bound shore does not exist, the stumps and roots of trees may be seen in the various bays, fixed in the sand some distance below high water mark. The lagoons on the east coast are thickly covered with trees about 30 feet high, which furnish an inexhaustible supply of firewood.

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Simpan Olim is the largest pepper producing district in Acheen, and will eventually be a source of great wealth to the Dutch. At present they only take a 4 per cent. share from those Rajahs whose territories they have actually conquered; the Rajahs themselves taking from 30 to 35 per cent. from the producers. But it is probable that all this will change, and the Dutch Government as soon as it feels securely established, will exact the utmost revenue that is obtainable from their possessions.

On the 4th August 1877 the Dutch annexed the island of Pulo Wey situated to the north of Acheen. They took possession unopposed and welcomed by the people; but the acquisition is not at present one of any value.

The Dutch now took in hand the task of reducing to subjugation the territory of Samalangan. Great opposition was anticipated as they were a warlike race and their chief, an influential and determined man, had plenty of warning of the coming attack and had time to prepare for it; the undertaking having been postponed from time to time until a sufficiently numerous force could be brought together for the purpose. It had been hoped the blockade would work the desired end; but though strictly maintained no result was apparent. On the 8th August a force under Colonel Vander Heyden of 3 Battalions of infantry 1,400 strong, 6 guns, some Sappers and 500 coolies embarked at Olehleh and proceeded to Samalangan accompanied by ten men-of-war with a Naval Brigade of 300 men.

The territory of Samalangan stretches about 10 miles east and west, and extends only about 4 or 5 miles in depth, where a range of mountains of from 3 to 4 thousand feet in height bounds it on the south. There is a thick fringe of forest of about a quarter of a mile in depth along the coast; and beyond, a fine plain. It is the most fertile country in Acheen, and the inhabitants were the most warlike, but their weapons were of a very inferior quality. In the present war they were assisted by the adjoining states of Merdoe and Endjong.

The Dutch force arrived off Samalangan on the 9th August, and on the following day proceeded to disembark. Every suitable landing place was observed to be covered by earthworks; so to mislead the Acheenese a portion of the fleet anchored off the western extremity of the coast and commenced a bombardment, whilst the remainder steamed off eastward before day light to a point beyond the land defences, and landed two battalions without opposition. The surf was high and the landing very difficult, and had not the Acheenese been deceived as to the point of disembarkation, they might have successfully opposed it.

The force was divided into a pioneer battalion, a support, and a reserve. The advanced party shoved forward to secure a position south of the belt of wood and jungle that fringed the shore, and on emerging

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on the plain beyond, surprised the Acheenese, who however soon rallied and came on bravely to the attack and were received by the Dutch in square and driven back by their breechloaders.

The pioneers bivouacked on the ground without food, water or reserve ammunition. Early the following morning the Acheenese attempted a surprise, dashed in, sword in hand and drove the Dutch into the plain; but after half an hour's fight they were beaten back with a loss of 130 killed. The Dutch losses amounted to about 70 officers and men killed and wounded, and 30 coolies. The sharp klavong wounds were very ghastly, but being clean cut they healed readily. The coolies being convicts were not entrusted with arms, and accordingly were helplessly slaughtered whenever they fell into the hands of the enemy.

Considerable difficulty and delay were experienced in landing the artillery and stores; in the meanwhile the landing place was intrenched reconaissances were made, and the Acheenese earth works along the coast were shelled by the war vessels. Had the Dutch made a dash and captured one of the earth works commanding a better landing place, they might have saved a deal of valuable time, as also secured a more healthy spot and stronger position. As it was this delay enabled the Acheenese to recover confidence, and change their tactics and lines of defence to suit the altered state of affairs.

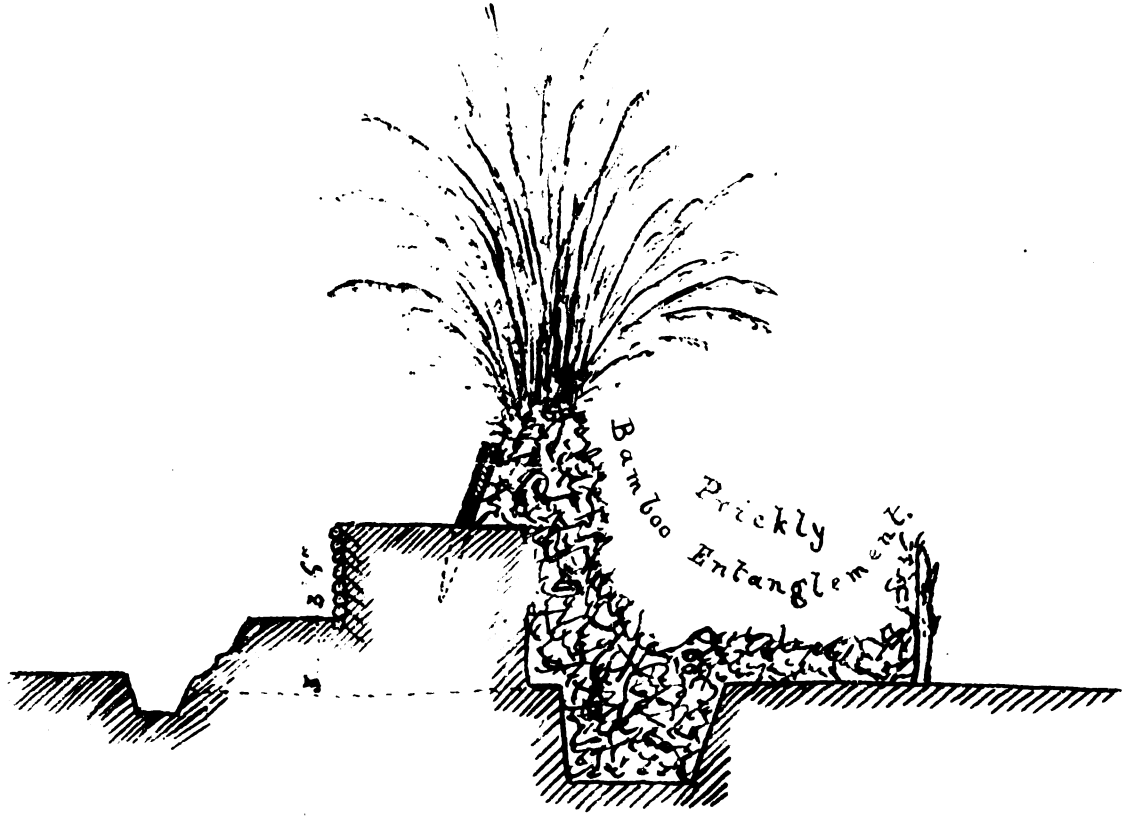
At dawn on the 19th August, after a very wet night, a reconnaissance in force of 600 men and 2 guns proceeded to Pengilit Toening, and arriving unobserved in rear of the defences, successfully engaged and dispersed a force of about 1,000 Acheenese, some of whom showed individual cases of the most reckless bravery. The Dutch returned to the shore bivonac after burning the village and destroying the earth works and lines of defence, which were admirably planned, with fléches, traverses, and covered-ways. These works were undiscernable beyond musketry range, the prickly bamboo hedges and bush serving as a perfect screen.

The next day a battalion and 2 guns were sent to Pengilit to draw off the attention of the Acheenese in that direction, whilst the main force proceeded along the coast to sieze a strong position at Qwalla Tamboer Five men-of-war effectively bombarded the position for an hour, and on the force advancing the lines of defence were found abandoned. Besides a strong fort or "banting" there were trenches and earth-work at every conceivable point of vantage. The admirable strategical measures taken by the Dutch in this instance, thus gave them, unopposed, the possession of a position which could not have been taken by assault without considerable loss of life.

A few other small forts were next captured in the neighbourhood; and small garrisons were placed in the defences at Qwalla Tamboer and Roemah Santot.

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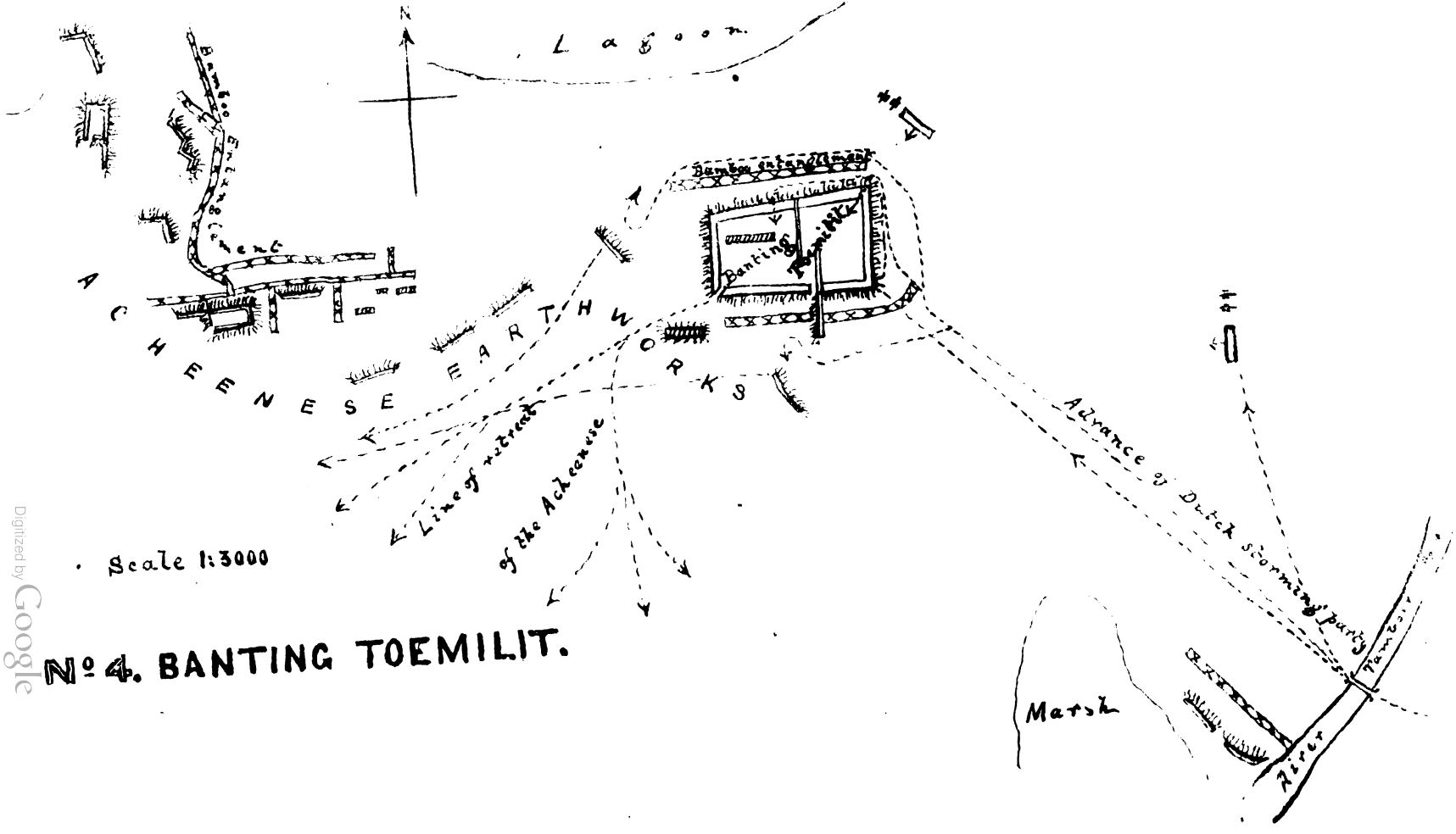
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No 8. Profile of "Banting" Toemilit.

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No 4. BANTING TOEMILIT.

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These newly acquired posts were now made the base of operations, and on the 26th August, when the preparations had been completed, the main body advanced from the old shore bivouac southwards and westwards; whilst a battalion and 2 guns converged from the new posts. The latter force carried by assault, with a trifling loss, 3 of the Acheenese barricaded villages; and then making a circuitous march through Tamboer and Toemilit, moved westwards and bivouacked near Balai the Rajah's residence, which was strongly held by a large force of the Acheenese.

Sketches Nos. 4. 5.

During the time the Qwalla Tamboer column had been acting as above stated, the main body advancing from the shore bivouac, changed its line of march north-westwards at 10 A.M., and probably being misled by the guides, blundered on to the strong fort of Kotta Toemilit, and on receiving fire therefrom, an attack was ordered. The aspect of the fort from 100 yards was simply that of a thick grove of prickly bamboo, and it was only when the very walls had been approached, that its strength was appreciable. The first fire was received on reaching the bridge; a company and 4 guns immediately shoved forward and replied to the fire at 300 yards on the east face of the fort, whilst a company of Africans advancing at the double, under the impression they were moving against a village, suddenly found themselves within a few yards of the fort. They got into the safest position feasible by standing in the ditch under the wall of the north face, suffering severely, but keeping down the fire of the defenders. Endeavours to get round by the west and south were beaten back by the fire from the strong earth-works on those sides, as well as from the fort. The banting was most obstinately defended for nearly an hour, but at last, after repeated attempts, Lieutnant Kalis gallantly forced his way over on the north face, and being followed in twos and threes by 40 Africans, drove out the garrison, who evacuated the fort by the south-west corner. The interior was found to be divided by a wall, for prolonging the defence after an entry had been effected. It was creditable to the assaulting force of about 500 men that they took such a position; but had the defenders been armed with breech-loaders, the result would probably have been different. The Dutch loss amounted to 60 killed and wounded, including their Commander-in-Chief. The success though dearly bought, had a great effect, as the Acheenese had considered the place impregnable, and having suffered severely, they lost heart.

The Dutch bivouacked in the banting, and next morning leaving a garrison of 1½ companies to occupy the place, joined the other battalion with the intention of assaulting the Rajah's Balai; but just as the advance had commenced, a flag of truce was brought out, and the Rajah sued for peace. A temporary suspension of arms having been agreed to pending the settlement of terms, the force marched triumphantly westward, and having lost its way, finally reached the mouth of the Samalangan river by night, and bivouacked.

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In advancing over open ground with bush on all sides, the formation adopted by the Dutch was the "wedge formation," somewhat similar to that of Sir Garnet Wolsey's force when moving on Commassie; about a company in front and rear in line, with the remainder of the infantry in column on either flank, and the guns and ambulance in centre; an opening being readily made for the guns to come into action when necessary.

Experience induced the Dutch in the East to altogether give up skirmishing and loose order formations. Had their enemies field pieces and breechloaders, the losses would of course have been terrible; but as the determined klavong attacks were what their soldiers most feared, close formations were found most effective; besides their men, with a few exceptions, when not immediately under an officer's eye were unreliable. Another peculiarity in the Ducth mode of fighting is their preference of volley firing to quick fire, for the reasons that the former has a greater demoralising effect on the enemy, and the fire is more under control.

From the bivouac near the mouth of the Samalangan river, daily patrols or rather "military promenades" were made to the south and west by the Dutch, to show the inhabitants that the country was occupied. On these occasions a village now and again would open fire, and be punished by being burnt down. Most of the villages were deserted, the inhabitants having fled to the hills with their property; but it was hoped they would return again as soon as peace had been restored. In Acheen Proper, during the early period of the war, the Dutch made a practice of burning every village, and the result has been that nearly the whole of the captured territory there is lying waste.

The total losses in the Samalangan operations amounted to about 600 killed and wounded on the side of the Acheenese, and 17 officers and 160 men on the side of the Dutch. Had the Acheenese been armed with any thing better than the old "Brown Bess" flint locks, klavong and old 6 or 3 pounder wall pieces, the Dutch must have suffered severely.

Peace was ultimately concluded with the Rajah of Samalangan in the middle of September, he binding himself to pay tribute to the Dutch, and to institute a more just system of government in the country.

The Rajah of Merdoe was next brought to terms after a couple of days bombardment by a few men of war.

Before withdrawing their troops to the Kraton on the conclusion of these operations, the Dutch placed a garrison of 250 men in a conveniently placed stockade at Kandang on the river Samalangan, and posted a block-house half way to the coast, thus holding a suitable point for any future operations that might become necessary.

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The reduction of Samalangan had been considered the final operations of the Acheen war. Petty chiefs would no doubt be continually revolting, and small expeditions have to be despatched for their reduction every now and again for some time to come; but the country was supposed to be so far conquered that there was no probability of any operations on a large scale again having to be undertaken although a force of about 10,000 strong would need to be kept in the country for yet a while.

A perfect lull followed the operations of autumn 1877, and there appeared every prospect that, such chiefs who had not already tendered their allegiance to the Dutch would shortly do so. So sanguine were the Dutch Authorities, that they forthwith proceeded to cut down their expenditure to a minimum, troops were withdrawn from the country, a number of stockades were abandoned, and the lines of defence in great Atjeh were considerably reduced.

No sooner had the Acheenese gathered their spring crops in 1878, than every thing burst into a blaze again. Two determined attacks were made on the Dutch station at Sigli, and the buildings destroyed; and the Dutch garrison at Edie on the east coast was attacked by the state of Gedoeng. A column 1200 strong under Colonel Vander Heyden accordingly set forth to restore order at Edie, and after a severe engagement reduced the Rajah to submission. The force next proceeded to Sigli, and after some more severe fighting, likewise reduced the Rajah of Giegan to submission.

These operations had only just been completed, when Colonel Vander Heyden was forced to return at all speed to the Kraton, as the redoubtable Abdool Rachman had forced the Dutch weakened lines with, it was reported, 8,000 men, and had devastated the IV Mookims which had been the first to submit to the Dutch, besieged several of the stockades, and threatened the Kraton. Severe fighting ensued; and large reinforcements were required from Java, with the object of stricking a decisive blow in the autumn, against the powerful XXII Mookims. The result of these operations have not transpired, as no detailed accounts of a later date have been received, beyond the information of a few minor engagements.

The death of the Sultan of Acheen in 1874 was, perhaps, the greatest misfortune that could have happened to the Dutch in this expensive war, which has now cost 20 millions sterling, as it left the Country with no acknowledged head of affairs, and the war has been thereby much protracted, each petty chief holding out as long as possible, and the fanatical, restless, and lawless people being easily excited by the priests.

In the Acheen war there was no quarter given or received, and no prisoners were taken, except such as were needed for guides. The Dutch losses in killed in action and died from wounds and sickness

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amounted to over 100 Officers 3,300 Europeans, and 2,000 native soldiers, besides several thousand coolies. The numbers invalided were excessive.

The Netherlands Indian Army.

The Governor General of Netherlands India is ex-officio in supreme command of the Dutch forces in the East, and under him is the Lieutenat General Commanding-in-Chief, the head of the "Department of war" in Batavia. This Department is divided into the following sub-departments each under a Colonel. 1 Infantry and Cavalry, 2 Artillery, 3 Engineers, 4 Intendance, 5 Medical, 6 General Staff.

The three great Military divisions in Java are commanded by Colonels, the district throughout the colonies by Lieut-Colonels, and battalions by Majors. In fact all commands are held by officers one grade lower than in British India. Commissions in the army are obtained only after having passed four years in the ranks, and the candidate must be unmarried. Probably 50 per cent of the Dutch army are the sons of gentlemen and respectable traders. Promotion is made by seniority in each arm, no one under the rank of Captain being passed over unless unfavourably reported on; but quite 25 per cent of Captains never reach to the rank of Major, such are kept on until the completion of 20 years service and are then retired. The average rates of promotion are 11½ years to Captain, 6 years to Major, and 4 years to Lieutenant Colonel. The rates of pay and furlough rules are only a trifle less liberal than those in force for the British Indian Army. It is impossible for any officers to behave better under fire than those of the Netherlands Indian Army; the hope of winning the much prized "William Order" being a great incentive to deeds of daring. The rules for matrimony are peculiar; officers in the service being forbidden marriage with pure natives, but allowed to marry ladies of color and others, on giving proof of the young woman's respectability and on her swearing not to accompany her husband on service. The Medical officers represent most of the European nationalities, the home supply being insufficient.

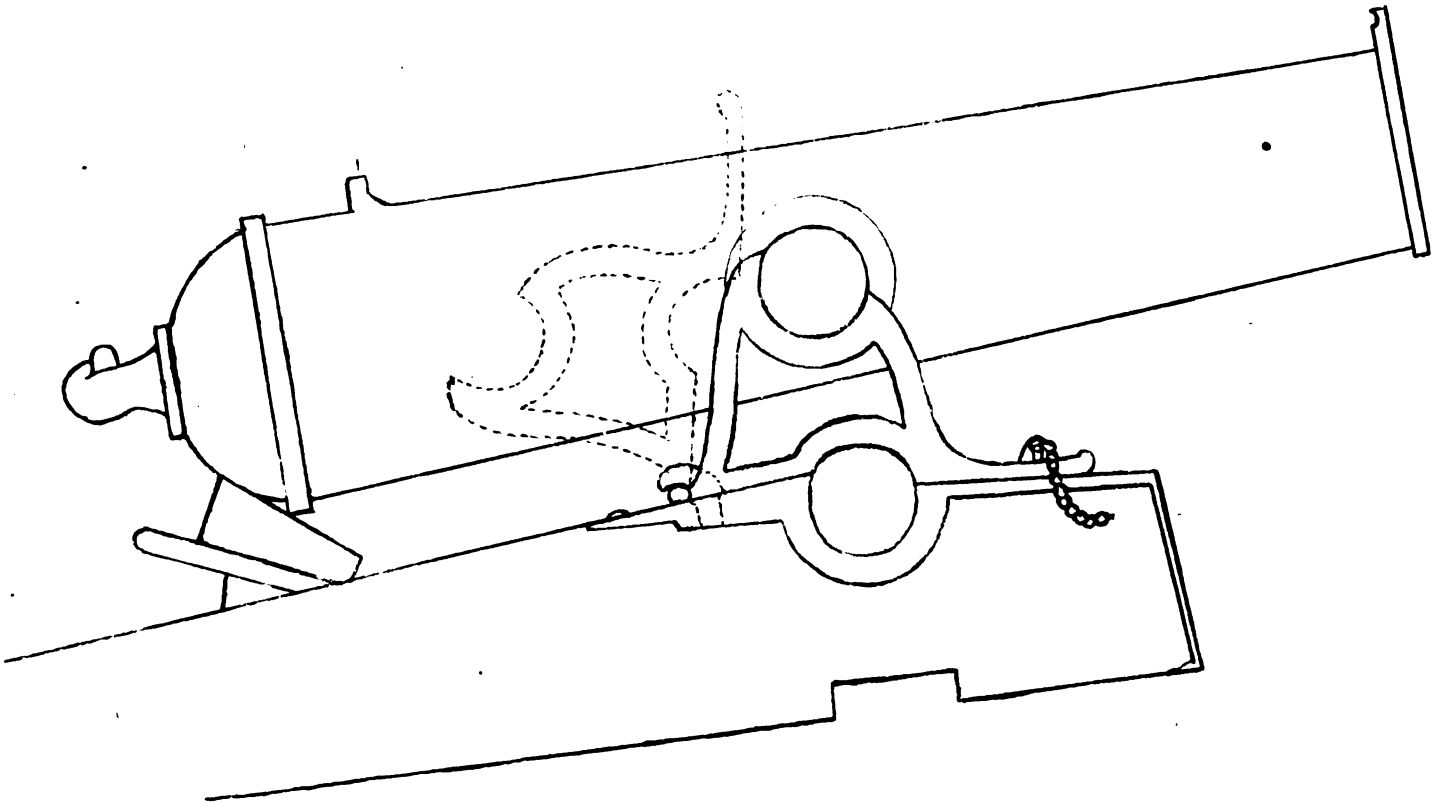
The Code Napoleon is the Dutch guide.

Service in the ranks for Europeans is for 6 years with re-engagement for 2, 4, or 6 years, and pension after 12 years service. About $\frac{2}{5}$ of the European troops in Acheen are Dutchmen, the rest being Germans, French, Swiss, and Belgians. The Germans are the best soldiers, and the Belgians and French the worst, many of the latter being communists and men of the lowest stamp.

The Native troops are enlisted from the various races from Java and the adjacent islands. The Amboynese, Christians from Amboyna and Celebes, are par excellence the pick of the native troops; they are equal to the Goorkhas, but are only procurable in sufficient numbers to form one battalion. The Africans from Elmina on the Gold coast were

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N^o 6. *Mountain Gun of 8 Cent^s (3·12")*

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reduced to 400, owing to casualties, and the field of enlistment being now closed to the Dutch. They are the hardiest soldiers in the army, but difficult to handle in action. They seem impervious to malaria; but fall easy victims to cholera. Next in order of merit are the Javanese and Sundanese from Java, who form the majority of the native army, and are said to be good soldiers. Besides the above there are a few other races of less note enlisted. In quarters the Europeans and Natives receive seperate accommodation, except the Africans who call themselves "Black Dutchmen" and prefer being with the Europeans; but in the field and on duty, all races are mixed indiscriminately, the highest in rank taking command.

The dress of all arms is the same, viz, a high forage cap, a blue tunic, with plaited skirts and trousers, gaiters being worn, except by the cavalry in the field. The different arms are distinguished only by buttons, and blue piping for the infantry, and red for all other branches of the service. Helmets are now being brought into use, it having been found that, next to malaria, the sun is the European's worst enemy in Acheen.

Sketch No. 6.

Guns of position in the Kraton and stockades, and mountain artillery for field purposes, are in greatest favour; field artillery being little used, and horse artillery not existing. The bronze 8 centimetre mountain gun is peculiar, and apparently a very serviceable gun. When drawn by ponies or mules, a man usually walks at each wheel, holding a lanyard hooked though a ring in the axle, to steady the gun. In heavy soil from 6 to 10 men were found to draw the gun better than the mules. The main feature of the gun is the upper trunnion plate, by placing the gun on which high angle fire up to an elevation of 35° is obtainable without toppling over the gun; on ordinary occasions the gun is worked on the lower trunnion plates. By diminishing the charge, practice, similar to mortar practice can be obtained, shells being thrown to within 500 yards. Most excellent practice was made by these guns at every range up to 2,000 yards. Each battery of mountain guns consists of 6 guns and 6 mortars.

The Netherlands Indian Cavalry, mustering a few squadrons, is a very poor body indeed. The men are mounted on very good hardy little ponies; but they drill indifferently, are never practiced at out-post duty, patrolling, or dismounted service, and are only useful as orderlies.

The Infantry consists of 18 field battalions, nearly ¼ of which are quartered in Acheen; some are class regiments, the rest mixed. There are also 10 garrison battalions. Each battalion has a Major, Adjutant, and Captain and 3 Subalterns to each company of about 150 men, there being generally 6 companies in a battalion. They are armed with the "Beaumont" rifle and bayonet, a most simple and excellent weapon up to 1,200 paces. Each man also carries a knife for clearing jungle, and

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in heavy marching order, 50 rounds of ammunition and a pack weighin 20lbs.

No camp equipage was used in Acheen, and nothing carried for th men except their rations, and 4 cooking caldrons for each company. O military expeditions in Acheen every thing is carried by coolies, eac man's load being 44 lbs. Free coolies not being easily obtainable, con victs to the number of about 4,000 are kept in Acheen, and employe in road making and clearing ground, when not required in the fiel Good service is rewarded by the sentence being remitted in whole o part. To move a battalion of 500 men for one day, there are require 60 coolies for carrying food and caldrons, 50 for the ambulance, and 4 for reserve ammunition.

The experience of many years has made the Dutch quite *au fait* a temporarily and quickly housing themselves. No tents are carried, bu the rich tropical vegetation of their eastern islands furnishes nearly a the requisite materials ready to hand. When actually in presence of th enemy, they surround the bivouac by logs and branches with sometime a shelter-trench inside, strengthening it from day to day by placin sharp bamboo spikes all round, and with a telegraph wire entanglemen outside all. The whole force in bivouac is divided into four nigh watches of 3 hours each, from 6 P.M. to 6 A.M. All are formed into fou ranks extended round the interior of the bivouac each man opposite hi post. The front rank at 6 P.M. moves forward and occupies the barricad and the other ranks lie down 3 yards behind, till 9, 12, and 3 o'cloc respectively. This system was adopted in preferance to postin sentries, owing to the partiality of the Acheenese for night attack When it was intended to form a bivouac near the coast, the frame work for huts were carried, and in a couple of hours the troops were comfortab ly housed under a matting roof. The stockaded positions held by th Dutch in Acheen, were nearly all formed of cocoanut logs placed per pendicularly 9′ out of ground, and 3′ under ground, with bastions for 12 or 8 centimetre gun at two opposite corners, and a banquette of earth or bamboo 4′ from the top, and the outside surrounded with obstacle such as prickly bamboo branches, bamboo spikes, wire entanglement &c Large lanterns, dark towards the work, were placed at intervals of 60 yards all round the stockade, about 50 yards from the faces, as they had been found most useful in helping to detect an intended night surprise.

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III.

THE CAUCASUS AND ITS SIGNIFICANCE TO RUSSIA WITH REGARD TO HER EUROPEAN AND ASIAN RELATIONS.*

BY MAJOR O. R. v. B.

TRANSLATED BY P. MOSA.

THE AUTHOR'S PREFACE.

EVER since the will of Peter the Great, the Russian Cabinet has been longing for the catastrophe now about to burst over the Turkish Empire. Down to the present day, Russia has obstinately endeavoured to gain a firm footing on the Balkan Peninsula, and to make herself mistress of Constantinople.

The present policy and attitude of the Powers leave scarcely a doubt that Russia has this time succeeded in gaining them over to her ideas, which, as far as they have been proclaimed, are said to be strictly limited to the task of freeing the Christian nationalities from the Turkish yoke, and of creating a state of things which would guarantee them an existence of spiritual and physical life.

Availing herself of the unexampled disorder of the Ottoman State finances, the heavy oppression of the crescent towards all other denominations, and of the violent acts of a covetous fanatical bureaucracy—which offer Russia an occasion to adjudge herself the right of executing a long cherished plan—she is arming to dismember the Turkish Realm under the pretext of regulating its internal affairs. This is simply an outrage on the civilization of Europe.

But, having witnessed the repeated displays of her power to the same end during the present century, the world can be no longer deceived by the illusion of Russia's 'purely benevolent intentions.' Who is there that would still believe Russia capable of sacrificing millions of money and the blood of thousands of her subjects, solely for the purpose of improving the lot of the Christians under Turkish rule?

The claims of her own interest have ever been the sole guide of Russian's policy, and the pretext for the present invasion of Turkey, the fourth of its kind since the commencement of this century—is

* This was originally written in 1877.

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merely intended to mask her traditional schemes of conquest. Russia's real object is to effect a lodgement on the Balkan Peninsula, and thereby to become paramount on the Black Sea and to extend her sphere of power in Europe. As in 1795, she is sure to drop the mask as soon as this object has been gained.

Between the events which marked the epoch of Catherine II., and Russia's latest moves, there is undeniably a striking analogy.

Ever desirous of extending her dominion towards the south, the Polish war of succession (after the demise of August the Strong, 1733) afforded Russia a welcome chance for intruding into the Polish quarrel. By the grace of Russian bayonets the Elector of Saxony became King of Poland, but in reality he was merely a Russian vassal.

Then, as now, Russia understood how to hide her intentions under the cloak of benevolence, the better to realize her wishes regarding Poland, the overthrow of which had been hatched as far back as 1733. The year 1795 witnessed the dénouement of the drama: Russia incorporated 8,000 square miles=4,603 myriam of Polish territory with her dominions, and the result was a considerable approach of her frontier towards countries whose inhabitants are of kin to the Russian people and profess their faith.

During the following epoch of peace, Russia was busily engaged in creating what must be called a community of interests between the Empire and those cognate petty nations, with a view of utilizing them for her own interests at the proper time, that is, to widen her sphere of power in Europe by means of their support.

The insurrections in Bosnia and Herzegovina, the attack made by the vassal state Servia, and the war of the Montenegro Principality, justify our opinion: for, not content with having supplied arms to, and subsidizing, all these combatants, Russia has actively supported them by permitting her subjects to swell their ranks. These skirmishes formed the prelude to the sanguinary drama now being acted in Europe and Asia: they were needful to weaken Turkey as much as possible beforehand, to save appearances in the opinion of Europe, to gain the Powers for her interests, and to make time for the necessary war preparations.

The events of 1828-29 and 1853-55 had not been lost upon Russia and her present action has been well prepared, politically as well as from a military point of view. On both previous occasions her design was frustrated by the European Powers, who, having fathomed Russia's intention, checked her aggressive policy by their "Halt! so far and no farther." In 1854-55, it was especially the attitude of Austria which paralysed Russia's action, for Austria, apprehending danger to her own existence, adopted a policy which arrested Russia's arm at the very moment of clutching at the long-coveted prize. Under the onerous

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fetters then forced on her, Russia is still writhing, because the restrictions respecting the Black Sea under which she was placed, have deprived her of an essential factor for the realization of her designs.

Fully comprehending the situation, and alive to the difficulties which beset her on the European side, Russia there-upon changed her tactics, and has since sought to gain the desired end by way of advancing through Asia. Finding that all endeavours to extend her south-western frontier were being frustrated by the European Powers, who opposed them even by force of arms, Russia has ever since 1828-29, steadily worked to open Asia Minor for further movements. To this end the intermediate highlands have been turned into a secure basis for warlike operations, a basis through which Russia commands a free passage. By these means she has gained a double purpose: on the west her armies may now advance through Asia Minor in order to reach the southern shores of the Black Sea, and Constantinople; and on the east she may energetically support her operations in Central Asia. In short, it needs but a glance at the map, to comprehend the full strength of Russia in possession of the Caucasus, and how very valuable to her the command over this mountain region really is.

England and Turkey had long since understood this, and have acted accordingly. To forestall the danger, Turkey has fortified Armenia—England trying to achieve the same object by increasing her influence over the nations of Central Asia. At the commencement of the present century the British Cabinet, apprehensive for England's trade with Turkey and India, left no stone unturned to counterpoise Russia, and to put difficulties in the way of her onward march in Central Asia.

England courted the friendship of Persia. Missions, supplied with large sums of money and empowed to make great promises, left London and Calcutta for Teheran; and on the appearance of the ghost that rose in the shape of a Russo-French-Persian invasion of India, England employed every means at her disposal to break the powerful influence of France at Teheran. This object was at last gained by means of a preliminary agreement, the third article of which stipulated that Persia was to be closed against the passage of any European army intended to invade India. For this favor, however, England had to pay large subsidies, which became a heavy burden on the Indian budget.

After the conclusion of peace at Gulistan between Russia and Persia (1813), the preliminary agreement between England and Persia became a formal treaty, by virtue of the sixth article of which England had bound herself to support Persia with an army from India whenever Russia should attack that country. In fact, such an attack on the part of Russia was to be regarded as a *casus belli* by England, the latter being bound forthwith to fight the common enemy. In 1826, however, England lost her influential position with Persia.

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Supported by British gold and arms, the Shah attacked the Russians then engaged in Caucasia. Sanguine of an easy victory, he was in hopes of regaining the provinces lost in 1813, and of effecting an entrance into the Caucasus, never again to leave it. But General Paskevich defeated and scattered the Persian forces; and in 1827, Russia having taken the offensive, the Shah lost Nakshivan (Nakhichevan), and the Khanship of Erivan—while England, evading her engagement on the paltriest pretexts, shuffled off. Hence the Russo-Persian war had no sooner ceased, than England's influence vanished as rapidly as it had been gained; for the Court of Teheran understood the part that England had wished Persia to undertake, and which was to the effect of keeping Russia engaged in Caucasia, to check her advance on the Hindukush, and to suffer Persia to be crushed for the sake of England.

Finding that nothing more was to be hoped for from Persia's friendship, England assumed a hostile attitude, and compelled the Shah to abandon his design on Herat (convention of 1853). This exasperated him to the highest pitch, and, changing his policy altogether, he made friends with Russia, going the length of concentrating troops near Tabríz and Kermanshah (during the Crimean war), in order to make common cause with Russia against England. But for want of means, this intention would have been carried out. In 1856, England made war on Persia, with a view, on the one hand to arrest the growth of the Shah's power, and on the other, to reduce Russia's influence in Central Asia—in which, however, England failed. For Persia has after all ruled at Herat, while Russia's influence, far from diminishing, actually increased. Russia even undertook the construction of railways in Persia, and the time is not far off when she may be expected to place the line, built with Russian money, under her own protection: that is to say, when the entire line as far as Bandar Abbas will be militarily occupied by the Russian Government, and the most exposed stations will be fortified. This much is certain, firstly: that the time of Persia's liberty of action *(Freiheit der Entschliessungen)* has already gone by, such liberty now being illusive; and secondly: that Iran must shortly sink to the level of a mere dependency of Russia.

Two [political] currents, running counter with one another, are therefore threatening to meet in Central Asia. From the South, England endeavours to utilize Kashgar and Afghanistan as bulwarks against the dangers which, drawing nigher and nigher, menace her existence in India; from the North, Russia seeks to advance southwards, in order to gain a road to India.

That country [Persia, Afghanistan, and Baluchistan] situated between Russia's present frontier and the Indian Ocean,* excepted, the Russians have, within the last 25 years, already succeeded in con-

* [More correctly the Persian Gulf and the Arabian Sea.]—*Tr.*

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quering Central Asia. In 1847 their boundary line ran across the Ili to the Alatau Range, and along the rivers Chú and Syr Darya. A little later they crossed the first-named river [Chú] to the end of gaining a natural frontier abutting upon the Kirgiz Alatau, the Boroldai, and the Karatau. In 1853 the Syr Darya was occupied as far as Akmeched, and in 1855 Russia established new colonies on the Ili. The year 1860 was marked by the capture of Tokmak and Pishpek; and undertaking a series of conquests in quick succession, her Asiatic possessions soon extended to the heart of the Bokharian Khanate (1868). In 1871 Russia added the Kulja district to her Empire, thereby separating Mongolia from East Turkestan; and two years later, after the successful termination of the expedition to Khiva in 1873, her southern frontier was pushed on to the Amu Darya. Consequent on these moves ahead, the boundary line of Russia's Central Asian dominions now to be taken into account, extends from the eastern extremities of the Tianshan Mountains to be mouth of the Attrek on the Caspian Sea.

Russia's expedition to Khiva, and her influence, now reaching as far as Bokhara and Kokand, claim the full attention not only of England but likewise that of Europe at large; for as in Asia Minor, so in Central Asia, Russia is preparing herself for events which can hardly take place without lastingly affecting our own quarter of the Globe.

From what we have now said about Central Asia, it will be seen that, before long, Russia is sure to swallow the Khanates of Khiva, Bokhara and Kokand, which are already completely within her grasp. This accomplished. her sway will extend to the foot of the Hindukush, after which a descent into the oases of East Turkistan, and the incorporation of the latter with her Empire, will probably follow as a matter of course. The Russo-Kashgarian frontier line runs from the Katundâba to the Terek Daban, that is, from the sources of the Kunges to those of the Syr: hence the Russians are *de facto* already commanding all the passes and crossing points leading into the Kashgar plains.

East Turkestan forms one of those bulwarks which England is anxious to build up as a protection to her Indian Empire against Russia. Nevertheless, (we can no longer even doubt this) Russia has the predomination at the Court of Kashgar, owing to her commanding military position above mentioned. From the Shatyr Kul the Russian frontier runs northerly, across the Jossi and Kogart Hills to the Urtaktau from which it turns westwards, retaining this direction as far as the sources of the Tenling River; from the latter it continues towards the south-west, in the direction of the Ferghana Valley, whence, turning to the south-east, it reaches the sources of the Zarafshan—thus completely clasping Kokand from the north, east, and west, *i.e.*, as much of that Khanate as still remains.*

* [Kokand was annexed on the 2nd-14th March 1876; the author's pamphlet is dated 1877. Hence he is clearly ignoring the fact—perhaps to shine the better as a prophet.]—*Tr.*

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Russia had no sooner gained the object of her aggressive policy in Turkestan, than her attention became occupied by Bokhara, which, seeing that it adjoins Afghanistan, is a country of great importance to Russia—always bearing in mind how vast an interest the English have at stake in Kabul. In 1866 the Russians took Forts Uratiube and Jizak, by means of which they command the valley of the Syr.

With regard to Khiva, Russia has operated as successfully as elsewhere. Her influence there is of no mean order, and to have the Khanate well under thumb, the Russians have not been slow in constructing new forts on the Oxus.

As to Afghanistan, it forms the focus, as it were, of the whole Central Asian question, for it is there that the fate of the British power in India will be ultimately decided—unless the English resolve upon defending themselves on the Indus. This, however, is hardly probable, except if they be driven to it by force of circumstances: which, it is true, does not lie beyond the range of the possible, because ever since 1839-42, the Afghans have not sympathized with the English. After the withdrawal of her garrisons from Afghanistan (1842), England tried to regain her lost influence by means of aiding the Afghans in their contest for Herat with Persia. To this end, she subsidized them to the amount of 2,600,000 fls. per annum, and continued paying them 100,000 fls. monthly, as long as the services of Afghanistan appeared to be worth paying for in the opinion of the Indian Government.

But despite all the presents in the shape of arms and cash made by the English, the relations between Kabul and Calcutta have been steadily getting more and more strained, the cause of which would appear to be that, in the opinion of the Afghans, the English might fail in averting the danger of a Russian attack from them—seeing that, hitherto, their protests have failed to check Russia's onward march in Asia—an apprehension which, in all probability, induces the Afghans to follow the safer course of placing themselves upon a friendly footing with Russia. This could not escape the English, and, comprehending the state of things we have described, they make no longer a secret of their intention to seize Afghanistan anew, and [there] to build strongholds for the purpose of providing outworks in defence of India. With this end in view, the English have hit upon Herat and Kandahar.

Extending their territory in Central Asia, the Russians have, at the same time, taken wide tracts of country from China (in the remote east 1854-59). Having made Russian possessions of the Amúr and of Ussúri, they also appropriated some of the steppe-lands about Lake Zaisan (1864-69), and installed themselves on Sakhalin Island. Properly speaking, these acquisitions have no direct bearing upon our theme; still, the better to illustrate Russia's traditional policy of conquest, we could not but shortly mention them.

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From this succinct exposé of affairs, both in Europe and Asia, it will be admitted to follow that the interests of the continental European Powers are identical with those of great Britain: for every addition of power to Russia is a menace in one direction or other. Hence we put up no empty vision, if we assert that the subduement of the Caucasian mountaineers was not the sole aim of Russia's policy: placing herself in possession of the Caucasus, she had higher objects in view. Russia fights for the trade of the world. To this end she is ever ready to seize fresh territories and to swell her population. Hence, too, arose the necessity of commanding a basis from which she may, indirectly, influence Europe, and at the same time back, and effectually support, her operations in Asia!

This basis is the Caucasus, which we will now endeavour to prove.

Geography and Statistics.

The Caucasus, forming the south-eastern corner of the Russian Empire, abuts upon Astrakhan and the plain of the Don on the north, Persia and Armenia on the south; upon the Black Sea and the Azov on the west; and upon the Caspian on the east.

The area of the entire Viceroyship amounts to 7,938 square miles*=4568.03 sq. Mm.; its population numbers 4,157,517 souls, that is, 612.8 per square mile=0.575 sq. Mm. The country is divided into—

Cis-Caucasia, and—

Trans-Caucasia.

The main chain of mountains extends from west to east. This highland region rises in three distinct ranges, and is populated by a great variety of peoples and races. The most elevated and massive section of the Caucasian mountain system is formed by the Elbrus, attaining 17,425 feet in height. From this peak issue the following branch ranges:—

a, The Western Range, extending to the Strait of Kerch (which latter connects the Black Sea with the Azov);

b, The Eastern Range, extending to Cape Apsheron on the Caspian: (these two ranges, 150 miles in length, traverse the country almost in a straight line from west to east);

c, The South-eastern Range, which overlaps the Persian frontier, and joins Mount Ararat; and—

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* [German miles, it is presumed.]—*Tr.*

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d, That narrow ridge of hills which extending along the coast of the Black Sea, runs into the Pontian Mountains trending away parallel with the seaside.

Besides the above named, some other peaks rise to considerable altitudes. The ridge-elevation of the principal ranges varies between 7,000 and 8,000 feet (=2212—2528 Mm.)

As to the formation of the Caucasian Mountains, they present the characteristic feature of several ranges running side by side in long rows, which are more or less connected with one another. Resulting from this configuration, there are highland valleys of 20 to 30=(151—227 Mm.), or even more, miles in length, which the mountain ranges enclose in the manner of ramparts, and upon which nature herself has stamped the character of strongholds, as it were. From the bottom upwards and till the region of rock is reached, they are well wooded, the ridges being ever snow-capped. The dales and valleys abound in the most luxuriant vegetation, affording plenty of food for man and beast.

These highlands are intersected by many torrents and rivers, drawing their supply from a large number of glaciers. Their deeply embedded currents flow between steep craggy banks, and these ravines form as many obstructions [to troops]—in dry as well as in rainy seasons. In times of continuous rain-fall, or when the snow happens to melt rapidly, they reach a considerable height. The principal direction of their course is either north or southwards. On the north, a number of these streams help to form the Terek, which discharges into the Caspian (after passing Kizlyar); the rest dwindle away, and finally disappear, in the steppes of South Russia. The shortlived torrents descending southwards from the Western Branch, fall into the Black Sea. The mountain streams of the Eastern Range, commencing from the principal elevation, trend to the east, and those of the range which overlaps the Persian frontier, to the north; they form the River Kúr, which flows through the valley of Tiflis, and falls into the Caspian.

Means of Communication.

The perviousness was very inadequate. But by the construction of roadways the Russian Government have so far facilitated the accessibility of the mountains, that even large military bodies may now simultaneously cross them in several columns. Nevertheless, the rapid torrents render it very difficult to move troops in rainy weather, or during a sudden thaw, and at such times partial interruptions of all traffic are of frequent occurrence.

Owing to the peculiar configuration of these highlands and the independent spirit of the hill-population, the Russians succeeded but slowly in subduing the Caucasus; and while the struggle was yet having its course, they were making roads as they fought their way

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into the mountain recesses of the enemy. Acting on this plan, every rod of ground gained was immediately fortified, and connected with the country in rear; and thus each newly acquired strip of land was at once prepared for a basis of further operations, from whence the Russians, secretly concentrating themselves in superior numbers to the mountaineers, were enabled to attack them at important points and to surprise them in their rocky seats.

This sort of warfare led to the adoption of a strategical method by which the independent tribes have been fenced in by a network of roads, invariably connecting fortified points. These roads form lines either intervening between those tribes and the sea- coast, or separating them from each other, whereby their mutual intercourse and community of action were artificially rendered difficult; on the other hand Russia's influence grew more and more paramount as she succeeded in isolating the resisting hill tribes.

In this wise, there originated successive lines of communication whose diverging point is situated between Mozdok and Yekaterinograd on the 'Cossack-Line,' near the northern boundary of Caucasia, from which point the latter is connected with Stavropol, the seat of the Caucasian Government. The more lucidly to present this system of roads to our readers, we will treat separately of—

A. The longitudinal lines, and—

B. The transverse lines.

A. Longitudinal Lines of Communications.

These trend to the west and east of the 'Great Caucasian Roadway,' that, crossing the central part of the mountains, traverses the entire highland system of the Caucasus. Commencing from Mozdok, this macadamized roadway passes through Yekaterinograd and Vladikafkas (fortress), crosses the Kazbek, and leads to Tiflis; from thence running along the right bank of the Kúr, it turns to Saloglu, after which, taking a bend to the south-west, it reaches the stronghold of Alexandropol *viâ* Karaklis). From Alexandropol a continuation of this line leads into Armenia, connecting the Caucasus with Kars, Erzeroum, and so forth. From this main artery issue the following branch lines, running w e s t w a r d s:—

a, The line from Kobi *vid* Tib and Oni to Orbeli, from whence two roads run as follows: one by way of Khoni and Ozurgeti to Nikolaya (fort on the Black Sea); another to Kutais (fortress on the Poti-Tiflis railway), ultimately rejoining the Nikolaya branch;

b, The macadamized line from Tiflis *vid* Gori to Akhaltsikh (fortress), from whence, crossing the frontier as an ordinary cart-way, it extends to Erzeroum;

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And, running eastwards:—

a, This line issues a metaled branch to Erivan (between Tiflis and Alexandropol), from whence an ordinary road, turning to the west, runs into Armenia, crossing the frontier at Sumarly (stronghold); the line—

b, stretches from Elisabethpol to the fortress of Shusha (metaled), and from thence as a common road to Akh Oglan (stronghold), finally crossing the Persian frontier.

On the west of the great Caucasian roadway, the mountain chain is crossed by six, and on the east thereof by two, different lines. These are—

On the west:—

1, The line from the fortress of Andréyefsk to Anapa;

2, The line Ivanofskaya, Adagum, Krymskaya, Bakán, and Novorós, connecting the four last-named strongholds, by which it is defended; from Krymskaya this line issues a branch road to the fortress of Gelenjik;

3, This line begins from Yekaterinodar, and connects the strongholds of Grigóryefsk, Défansk, and Tenginsk;

4, This line connects the fortress of Maikop with Fort Beloréchinsk on the one hand, and with Nizhnefarsk on the other; its extension from Maikop runs through the Shetlib Pass, and *viâ* Fort Hamyshki to Shakhé;

5, Commencing from Kaladjinsk, this line runs to Fort Ageryntinsk, crosses the pass of Pségashko, and terminates at the fortress of Gagri;

6, The line from Staroshovaya across the Marukh Pass to Fort Ashara, where it joins the road coming from the fortress of Ustjúgúta, to end at Sukhúm Kalé (stronghold and marine harbour).

All these lines are formed by ordinary cart-roads, connecting the shores of the Black Sea (naval harbours) with strongholds [in the interior of the Caucasus], and crossing the transversals.

On the east of the great Caucasian roadway the mountains are crossed by—

1 *a*, The macadamized line from Sholkozavodsk to Azavyurt (fortress) and Eugene-yefsk (fort) from whence a common road leads to Núkha (*viâ* Tsúdakhar and Kúrakh): From

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Núkha, *viâ* Elisabethpol, to the Shusha Fortress, the continuation of this line is again metaled, and from the last-named place an ordinary cart-way runs to Khudoverin on the Persian frontier; a macadamized branch of this line, connecting Kúrakh with Kúba, turns eastwards and strikes upon—

2 *a*, The metaled line from Sholkozavodsk by way of Azavyurt and the fortress of Temirkhanshura to Karabúdakkend, and from thence along the Caspian coast, *viâ* Kúba to Baku (Cape Apsheron); Baku and Saliony are connected by an ordinary road, running along the sea-side, but the further continuation of this line, leading through Prishib and Lenkoran to Fort Astara and Persia, is metaled. A branch-road, issuing from Prishib and running along the River Vilgash, leads into Persian territory.

These lines as well as the great Caucasian roadway are connected with the transverse lines I., II., and III. (see below), and serve as means of communication between the Caucasus and the strongholds protecting its frontier against Armenia and Persia.

B. Transverse Lines of Communication.

I. This line, commencing from the Strait of Kerch, and running *viâ* Tamán and Andréyefsk, is metaled as far as Yekaterinodar, from whence a common cart-road, intervening between Grigóryefsk, Beloréchinsk, Nizhnefarsk, Kaladjinsk, Andrukhofsk, Psémensk, Staroshovaya, and Ustjúgúta, extends to Nalchik; thence, the metaling being resumed, it runs to Cherek, turns north-wards to Urukh, and continues *viâ* Yekaterinograd and Mozdok (following the left bank of the Terek) to Kizlyar;

II. The ordinary cart-road which trends along the north-eastern coast of the Black Sea, connecting all fortified points, marine ports, and towns, as far as Poti, from whence a macadamized road, leading through Kutais, Suram, and Gori, runs to Tiflis and, along the right bank of the Kúr, to Elisabethpol; thence, crossing the Kúr, it goes on to Shemakha and Baku;

III. This line, following the frontier from Nikolaya to Ozurgeti (between which points it is metaled), continues as a common cart-way to Akhaltsikh, Akhalkalaki, Alexandropol, Ani, and (along the left bank of the Arpa) *viâ* Sardarabad to Erivan, from whence a metaled road, following the left bank of the Aras, extends as far as Ordúbad.

Lastly, we have to mention the 'Rostof-Vladikafkas Railroad' with its Piatigorsk branch-line, connecting the Caucasus with Taganrog

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and with the entire railway-system of Russia; and the 'Poti-Tiflis Railroad.'

Military Review.

The Caucasian system of roads is calculated to facilitate the movement of troops in every direction, whether acting on the offensive or on the defensive.

Three of the longitudinal lines cross the mountains, being at the same time connected with the transversals I., II., and III.; and six longitudinal lines strike upon the transversals II. and III. Each transversal forms '*Rokade*'-line,* favouring the concentration of troops in any chosen locality, and all have been constructed in defference to strategical requirements. The worth of the entire network of these Caucasian roads is further enhanced by fortified military stations, forts, and strongholds, protecting and securing the same: and by the Rostof-Vladikafkas railway, a line of the greatest importance, greatly facilitating the transport of war-material of every kind from the interior of Russia. As to the Poti-Tiflis line, it might serve as a means for rapidly shifting forces; otherwise it has no general importance: nor can it acquire any until the Russian Government succeed in maintaining a fleet, at least equal to that of Turkey, on the Black Sea. For till then the Porte may at any time blockade the coasts and interrupt all communication by water.

Fortification and Towns.

Speaking of the roads, we had already occasion to mention the strongholds of Caucasia. We will now proceed to name the most important of these points, giving details as far as they are known.

Cis-Caucasia.

Gubernia (governorship) Stavropol: City of Stavropol, the new capital of Cis-Caucasia; the fortress crowns a high mountain.

Terek Region: Vladikafkas, and Mozdok on the Terek, commanding the entrance by way of the great Caucasian roadway. Vladikafkas bars the principal line of communication connecting Stavropol with Tiflis.—Konstantinoyarsk, fortress on the Little Kúma, situated at the foot of Mount Beshta (4,300 feet).—George-yefsk, surrounded by low swamps.—Kizlyar, fortress above the mouth of the Terek.

Trans-Caucasia.

Gubernia Tiflis: City of Tiflis, the capital of Georgia [Gruzinia], on both banks of the Kúr; elevation 1,350 feet; the city proper lies on

* [Perhaps "connecting"-line? I cannot trace the meaning of this term, nor its proper equivalent in English.]—*Tr*

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the right bank of the river, and behind it, on the south side, upon a rock, stands the ancient turret-fortress of Nariklea with its low-descending walls.

Gori, town and fortress on the Kúr.

Elisabethpol (Ganja), fortified town on the Ganja.

Lenkoran and Baku, fortified ports, both on the west-coast of the Caspian Sea.

Shusha, fortress, built upon high precipitous rocks.

Erivan, town adjoining the fortress, which measures 0·90 Km. in circumference, and commands a bare table-land; the works consist of a double wall; the military importance of the place is insignificant.

Alexandropol (formerly Gumri), town on the Arpachai, and a stronghold of the first class, capable of holding a force of 60,000 men, and commanding the road to the Turkish fortress of Kars (situated five miles=37·90 Km. from Alexandropol).

Poti, fortified port on the east-coast of the Black Sea; the fortifications lie between swamps and lakes.

Rionsk.

Redoubt Kalé and Anaklia, fortified harbours.

Nikolaya, redoubt crowning a sand-down.

Kutais, fortress, barring the Poti-Tiflis railroad.

Akhaltsikh, commanding a plateau; under the Turkish Government it constituted one of the principal strongholds of Asia Minor *(Vorderasien.)*

Derbend, fortified town on the Caspian, situated near the famous Caucaso-Caspian Gate.

In Abkhasia, a narrow highland tract extending for 25 miles on the south-west side of the Caucasus, the Russians permanently occupy a number of military stations and harbours; amongst others: Ilori, Dranda, Kelasúr, Sukhum Kalé, Psyrta, Bombara, Pichunda, and Gagri.

The Caucasus is, in the true sense of the word, thickly studded with strongholds, the Russian Government having spared neither money nor labour, to secure this highland region by well-placed fortifications. This applies especially to Trans-Caucasia, containing many works of the first class, constructed on the latest principles, and strictly in conformity to the configuration of the country. Hence it is not to be denied that

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in the Caucasus, as now fortified, Russia possesses a very strong, not to say impregnable, bulwark, from whence her armies may be poured both into Asia Minor and Central Asia, as the case may be: and behind which her troops, if beaten, may retreat to be reinforced and to recover their strength in safety.

Russia's Forces in the Caucasus.

The Caucasian Army is divided into seven divisions [corps], comprising the following troops:—

Infantry.

4	Grenadier regiments of 4 battalions each, ...	17,708	men.
24	Infantry „ of 4 „ „ ...	105,528	„
4	Fusilier battalions, ...	4,460	„
4	Kuban Fusilier battalions, ...	4,404	„
7	Cordon battalions, ...	7,898	„
1	Regiment of garrison infantry, ...	4,302	„
18	Local battalions and 64 local companies, ...	32,493	„
2	Sapper battalions, ...	2,000	„
	Total ...	178,793	„

Cavalry.

1	Caucasian Dragoon division (4 regiments of 6 squadrons each)	5,470	troopers.
30	Cossack regiments of 6 sotnias each ...	27,720	„
15	Terek Cossack regiments of 4 sotnias each ...	9,315	„
3	Astrakhan Cossack regiments of 4 sotnias each	1,863	„
	Total ...	44,368	„

Artillery.

6	Foot-brigades of 6 batteries (6 guns each), ...	216	guns.
1	„ „ of 8 „ (8 „ „), ...	64	„
5	Mounted batteries of Kuban Artillery of 8 guns, ...	40	„
2	Mounted batteries of Terek Artillery of 8 guns, ...	16	„
	Total ...	336	„

The militia may be estimated at 5,000 men (3,000 foot and 2,000 horse). Hence the entire army of the Caucasus comprises: of infantry 181,793 men; 46,368 troopers; and 336 pieces of artillery. This army forms the permanent garrison of Caucasia, and is strengthened according to the exigencies of the service.

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The infantry are armed with the Berdan breech-loading rifle, the cavalry with the breech-loading carbine of the same inventor, their side-arm being the Dragoon sword; a portion of the Cossacks carry lances.

The artillery have three, four, and nine-pounder breech-loading guns of various patterns.

To the Russian forces in Asia, the army of the Caucasus stands in the position of a *cadre*; and, as previously observed, the Caucasian troops are always ready to descend at the word of command, either to the steppes of Asia or Turkish Armenia.

Further we must mention the Russian war-flotilla on the Caspian, which may be utilized for the transport of troops and supplies, and which comprises the following vessels:—

3 Screw gun-boats with	...	...	13 guns.
7 Steamers with ...	...	...	17 „
3 Screw schooners with	...	...	14 „
4 Steam launches „	...	...	5 „
4 Transport sailing vessels 2 Schooners, and ... 8 Barques, ...	with together	...	49 „

Lastly, the 'Kafkas and Mercury Steam Navigation Company' are bound to maintain not less than fifteen steamers, all of which are at the disposal of the Russian Government in case of war, an agreement which applies likewise, to the steamers and sailing vessels of the 'Lébed (Swan) Company.'

Russia's Army in Asia

is made up of—

60,800 infantry,
32,650 horses, and
112 guns;—with a reserve of—
26,000 infantry, and
10,000 horses.

These numbers include garrisons and local troops. The armature is analogous to that of the Caucasian Army.

Considering [the wide extent of] Russia's frontiers in Central Asia, and the acquisitions which she has made in so short a time England's apprehensions certainly appear to be anything but groundless although it does strike one as something fabulous that with so small an army Russia should be able to maintain her sway throughout so immense an expanse of country: in addition to which she is not only successfully keeping together the most heterogeneal elements, but even pursuing an aggressive line of policy, leading to further incorporations

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of territory in quick succession. Yet, strange as these facts may appear, they are simple enough, and may be easily explained by the utter worthlessness of the Asiatics as warriors; their separation into innumerable nationalities, tribes, clans, &c., and the lack of unanimity resulting therefrom; their primitive armature; and by the all but indifferent attitude of the English since the Afghan war, after which they scarcely sought to revive their influence over Central Asia, until roused from their lethargy by Russia's go-ahead policy.

The Strategical Situation.

General Observations.

The Caucasus is an Alpine mountain region which, owing to the construction of an extensive network of roads under the Russian régime, has become quite pervious in the strategical sense of the word. This applies particularly to the Western branch of the chain, which is crossed by six different routes—between the Strait of Kerch and the Marukh Pass. The section extending from the latter to the great Caucasian roadway, is still impervious; and over the Eastern branch there lead three routes, including the great roadway.

From a strategical stand-point, a mountain range crossed by many lines of communication is better adapted for the offensive than for the defensive mode of warfare. Nevertheless, the defensibility of the Western branch of the Caucasus is not impaired, despite the six routes which cross the same: because the Russian Government, commanding the coast, have secured the approaches to them by means of forts, in addition to which they are guarded by fortified military stations and strongholds, placed along the second line of defence. Owing to the peculiar configuration of the country, an invasion cannot be effected except by way of one of the made roads: hence the forts and strongholds—which command the lines of communication at very ably-chosen points—must necessarily prove most serious obstacles.

Three transverse lines connect the thoroughfares intersecting the mountains: all naturally strong points and lines, requiring but a passive mode of defence, being fortified accordingly; such of the lines, on the other hand, as are better adapted for operating on the offensive, have been treated in a manner facilitating the sortie-style of warfare. The '*Rokade*'-lines, being covered by fortifications, are intended to serve as lines of defence, which—generally speaking, and considering how easily they may be broken in upon—must be regarded a mistake. In the Caucasus, however, this is scarcely of any consequence: for the mountain system is quite impervious and cannot be crossed at all, except by way of the roads constructed by the Russian Government, which are well fortified. As to the tracts of country lying between these roads, they are sufficiently covered—either by the configuration of the mountains, or by a river-barrier in front.

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We will now proceed to describe the—

Lines of Defence.

I. The line along the frontier of the region, supported by Fort Nikalaya, and the strongholds of Akhaltsikh, Alexandropol, Surmaly, Shusha, and Akh Oglan.

II. This line of defence runs along the north-eastern coast of the Black Sea; from Poti it turns eastward to Kutais (fortress) and Tiflis, beyond which it is covered by the rapid current of the Kûr. The middle course of this river is bridged at Elisabethpol, and its lower course at Kalakoiny and Saliany.

III. The fortified line Andréyefsk, Adagum, Grigoryefsk, Kaladjinsk, Ustjúgúta, Kislovodsk, Nalchik, Vladikafkas, Veden, and Temirkhan-shura, which would prevent the enemy from deploying their forces on issuing from the mountains.

In rear of this line, reserves and supplies can be safely concentrated and brought up to the front, for which purpose five railroads are available. Of these latter, three connect the interior of the Russian Empire with the River Volga, the fourth leads to Vladikafkas, and the fifth from Poti (east-coast of the Black Sea) to Tiflis.

In order to examine these lines of defence from a military point of view, we must draw a distinction between operations on the defensive, and such on the offensive, commencing our examination with those on—

A. The Defensive,

which may be divided into—

I. The defence in front of the mountains *(Gebirgsgürtel)*, and—II. The defence in rear of the same.

The line of defence in front runs along the transversals I. and II. but I. is fortified on a plan conducive to action on the offensive. On the main line of operations stands Alexandropol, forming an intrenched camp with detached *(Gürtel)*-forts, greatly facilitating sorties. The by-lines are marked out by Akhaltsikh (favoring an advance from the north-west), and by Ani and Surmaly on the south. On the defensive, these strongholds protect the position on the main line of operations against being turned by way of the by-lines, which latter—running aside of the main line and leading into the Alpine region proper—at the same time facilitate sudden movements on the offensive, as well as flank-manœuvres. The distance from this line to the principal basis (line III.) is 55 miles (=417·20 Km.), that is, far enough to expose the transport of supplies and even the safety of the communications. This drawback, however, is counterbalanced by line II., which, trending about

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mid-way between I. and III., runs at a distance of 25 miles (=189 Km.) from the former, and 30 miles (=227 Km.) from the latter. As to line II. in particular, it has the disadvantage of being rather unsuitable for action on the offensive: for should once line I. be lost, the northern slopes of the Pensathi Range and the southern Kúr ridges (following the course of that river) would have to be scaled [under fire of the enemy]. As an intervening basis, however, it forms an important link, connecting line I. with the principal basis (line III.); and in case of need it may afford a safe lodgement to fall back upon for the troops of line I., who could take up a strong position on the defensive, covered by the river-barrier [in front] and supported by the fortifications commanding the most important points.

Along line III. the mountains are defended from positions in the rear thereof. Like I., it has a number of well-constructed fortifications, which, however, are less appropriate to support operations—

B. On the Offensive,

than those of line I., both the works and roads of which are of a type to facilitate attacks [from the side of Caucasia]. This tells especially against Asia Minor, though, on the other hand, the Caucasus is nearly as important with reference to Russia's movements in Central Asia. (see further on).

Acting on the offensive against Asia Minor, the Russian army would naturally seek its support on, and rendezvous about the strongholds of, line I. Presuming the basis of all operations to be marked out between Nikolaya and Mount Great Ararat, the centre of attack would point straight at Erzeroum, presenting itself as the first political object of operations in that direction, and situated 30 miles (=227 Km.) from Russia's basis. To effect this attack, the Russian forces may avail themselves of the following routes *(Linien)*:—

First and foremost: the principal and most direct route from Alexandropol *viâ* Kars, Déli-Músa and Koprikoi to Erzeroum. Ten miles (=75 Km.) from Alexandropol rises Kars, a Turkish fortress of the first class; it commands the road to Erzeroum, and cannot be ignored. Five miles (=37 Km.) distant from Kars, on the crossing of the Alexandropol-Erivan road, lies the fortress of Déli-Músa: and two miles to the west of it, on the Erivan road, that of Gechevan. These two strongholds bar defiles and cannot be evaded, except by infantry at very close quarters; once isolated, however, all arms may pass them safely on the west side, proceeding along the southern foot of the Kumry Range (8,791 feet=2,778 M.), for there is a road connecting Kars with Khorassán. Lastly, the Russian army would strike upon Koprikoi, a fortress standing five miles (=37 Km.) to the eastward of Erzeroum.

This line forms the shortest connection between the basis of operations and the object of attack, but it has the disadvantage that Kars

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must first be taken before the offensive can take its course, unless the Russian force be numerous enough to invest the place, at the same time continuing operations. On the march from Kars to Erzeroum, the strongholds Déli-Músa and Gechevan could be evaded by passing northwards of them, but not without leaving strong detachments of observation at both, for a disregard of this precaution might expose the left flank of the advancing column. The line of retreat leads back on Alexandropol (centre of the basis) from which the retreating army cannot be forced away, and where it may find protection and safety within the fortress.

Collateral (Neben) Lines of Operating on the Offensive.

a, The line along the Black Sea coast, which is intended to secure line *b*, against surprises from the sea-side. To this end a column need but occupy the coast abreast of the invading army, proceeding as the latter advances, to conclude its task under the walls of Trebizond. To fulfil its double purpose, this column must be sufficiently strong to leave garrisons at all important points *en route*, able to frustrate any hostile attempt at landing till the threatened localities can be reinforced by the Commander in-Chief; if supported by a flotilla, the difficulties of its task could, of course, be considerably lessened.

Between Nikolaya and Trebizond this line issues four transversals connecting it with line *b*. Hence too weak a Russian column might easily be harassed in rear, unless every hostile attempt at landing be promptly forestalled by the army head-quarters: indeed, in case of retreat it might even be involved in a catastrophe, especially if the fortress of Kintryshi and the passes across the Kolar Mountains happen to be still in the hands of the Turks at the time.

b, The line Akhaltsikh, Machkal, Artvin, Thortum, Erzeroum—by which the Turkish fortress Ardahan can be evaded. Ardahan, at a distance of nine miles, commands, the ordinary cart-way between Akhaltsikh and Kars. Further on, the operations of a column would be influenced by the fortress of Ardanauch, situated five miles to the northward of the route, and by that of Pertakrek, two miles to the west. Five miles beyond Erzeroum the way is barred by the fortress of Koprikoi.

This collateral line of operations could only be made available by a Russian army strong enough to isolate Kars and Ardahan. Such an army might turn the Turkish positions and take Erzeroum by surprise, provided it be numerous enough to overawe the garrisons of, Ardanauch and Pertakrek without interrupting its onward march. From Machkal, however, this line runs nearly parallel with the basis, which is a drawback: for in case the Turks assume the offensive along the principal line of operations, they may seriously threaten the retreat

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from Ardanauch and Ardahan, and the Russians may even be driven into the Koilar Mountains, unless they are quick about gaining Machkal to retreat on Atchi.

c, The line from Erivan *viâ* Bayazid to Diadin, beyond which, turning towards the north-west, it strikes upon the main route and continues *viâ* Hassan Kalé to Erzeroum. As far as Bayazid this line runs close to the Persian frontier, but is less exposed, notwithstanding. By way of the northerly projecting corner of Persia, *viâ* Akhakhmed, the Russians may evade the difficult crossing of the Ararat: this, however, would imply an understanding with Persia, without the neutrality of which country a Russian column could scarcely venture to take this line, except under risk of exposing its flank to attacks from that quarter. In any case it would be indispensable to detach corps of observation against the southerly situated strongholds of Begirkala Khamúr, and Melaskerd. If Persia and Russia prove to be allied (which is by no means impossible), the troops of the former may either strive to effect a junction at Bayazid, or, undertaking to cover the left flank, advance *viâ* Malakaskar on Erzeroum—there to join the Russian army. In a retreat, this column would have nothing to fear, at least so long as the Turkish strongholds on the left flank were kept isolated.

The greatest distance between the principal line and its collaterals, as well as between the latter separately, amounts to 20 miles(=152 Km.) Parallel roads are all but unknown, and all these lines concentrate on Erzeroum.

The corps operating along these routes would have to depend wholly upon themselves, for mutual support is not feasible, owing to the non-existence of transverse connecting roads and the difficult character of the country intervening. Any co-operation and mutual support could only come into play within six miles(=45 Km.) of Erzeroum.

Once in possession of Erzeroum, Russia's further operations would entirely depend on the degree of exhaustion of her enemy, the condition and strength of her own army, and from the aspect of the political horizon: therefore it is impossible to draw any conclusion as to what may or may not happen. Regarding the chances of success or defeat on either side, we do not propose weighing them, and may, therefore conclude this paragraph by simply mentioning the lines of operation leading from Erzeroum to the Strait of Constantinople (Bosphorus). These are:—

1, The line following the coast of the Black Sea;

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2, The line Shabin, Niskar, Mersivan, Osmanshik, Boly, Ismid and Skutari, which forms the shortest route;

3, The line Egin, Kara Magara, Yazgard, Engúri, Nallykhan and Ismid;

4, That of Kharpút, Malatti, Albistan, Kaisarih, and Nevshehr [Kir Shehr ?], along the north-eastern shores of lake Tuz Ghieul to Bash Khan: or—across the salt-steppe *viâ* Severek to Afium Karahissár and from thence in a northerly direction *viâ* Brussa to Skutari; (The Russians would not follow this line unless the Turks had been previously driven to the south of lines 2 and 3; but even in this case, the main body ought to follow up the pursuit along the shorter line 3, whereby the retreat of the Turkish army might be cut off completely, or, at any rate, considerably delayed. These lines [1 to 4] radiate from Erzeroum and concenter upon the Bosphorus);

5, The line from Malatti to the Mediterranean, then along the sea-side as far as Adalia, and from thence *viâ* Denizli to Smyrna.

Strategical Observations with Regard to Central Asia.

Russia's army in Central Asia has its main support in that of the Caucasus, from whence it receives its equipment and all sorts of supplies, by way of Astrakhan, Petrofsk, and Baku. The transports from the interior of the Empire come by way of the 'Rostof,' 'Vladikafkas,' and 'Poti-Tiflis' rail-roads: and the Imperial and commercial flotillas of the East convey them across the Caspian Sea.

The most important tract of country with reference to Russia's policy is that extending from the ridges of the Elbrus Chain to the south-coast of the Caspian. We regard this tract as an indispensable factor in her hands, without which she could scarcely hope to consolidate her sway in Central Asia. Its possession enables Russia completely to paralize Persia, and to exercise a moral pressure upon Afghanistan. As yet the Court of Kabul still looks with self-confidence upon the independency of the Turkoman tribes dwelling in the Trans Caspian Region; but these tribes are being rapidly rendered amenable to Russia's supremacy, and their submission will open all the gates throughout Central Asia to Russian influence. The success in Turkomania is entirely due to the possession of Caucasia, from whence alone she can promptly and effectualy operate in that direction.

The Caucasus also forms a connecting link between the Black Sea and the Persian Gulf, and may enable Russia to establish a naval station in the Strait of Hormúz—thereby realizing a long-cherished scheme of the greatest magnitude in its consequences to Central Asia and Turkey

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in Asia, for in both directions she may then press forward with double vigor, from a basis extending from Caucasia to the Arabian Sea. Russia is indefatigably striving for an open sea-board, not too far from Europe and affording her direct access to the Ocean highways of the world; once mistress of the Persian Gulf, she may hope to see her ambition gratified: hence she will not cease pushing ahead in that direction.

Again with regard to Merv—which Russia would fain take by a *coup de main*, from thence to direct further operations—the Caucasus as a basis affords her a much better chance, than Orenburg. For Krasnovodsk (in steam-connection with Baku) lies only 600 versts (about 400 English miles) from New Urganj, whereas the distance from Orenburg, taking the nearest route along the west-coast of the Aral, amounts to 1,300 versts (about 860 English miles); the longer route by way of Kazalinsk measures 1,500 versts or nearly 1,000 English miles. It takes caravans 50 days or more to reach Orenburg, but only 19, and with good camels only 12 days, to accomplish the distance to Krasnovodsk. Allowing 15 days to represent a fair average, and counting five days for the transport from Krasnovodsk to Astrakhan, and five days more from Astrakhan to Moscow, it will be seen that a caravan from New Urganj can easily reach Moscow within 25 to 30 days, whereas it would need from two and a half to three months by way of Orenburg.

Concluding Inference.

In the preceding pages we have shortly described such of the ethnographical and geographical characteristics of the Caucasus as influence its defensive power; futher the changes wrought throughout the region by the Russian Government; and, lastly, we have shewn of how great a value to Russia this highland region is. The inferences to be drawn from the foregoing may be summed up as follow:—

Russia's desire to extend her dominion towards the south of Europe, led to the division of Poland, of which she appropriated the lion's share; since then, however, the out-spoken resistance of the European Powers has put a stop to her spreading in that direction. Not strong enough to realize her schemes in Europe, Russia began striving for a way into Asia Minor, and at the same time to widen her sphere of power towards Central Asia—for the double purpose of breaking the influence of England, and to mature herself for action in Europe.

By the conquest of Caucasia and its conversion into a secure basis, Russia has placed herself in a position to execute these designs. From the Caucasus her armies may now descend to the Bosphorus, the Mediterranean, the Persian Gulf, or the Arabian Sea, and from thence she may advantageously support her operations against India. Again, in the Caucasus she possesses a safe retreat if defeated or repulsed; and, considering the natuaral configuration of the region and its works of defence, the chances of a successful invasion are exceedingly small. In

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this well fortified highland region the Russian Armies can always safely collect after a defeat, be reinforced, and prepare themselves for fresh operations. By reason of its extensive network of roads and roadways and its many fortified points and strongholds, the Caucasus offers great facilities for the offensive, both against Turkish Armenia and Central Asia; on the other hand, art and nature combined have rendered it a bulwark which may well be considered strong enough to resist all attacks. Hence from the Caucasus, Russia may all but scot-free pursue her traditional policy of conquest towards the west and south.

Once in possession of Armenia, the country westwards as far as Skutari presents no strategical or tactical impediments; the establishment of permanent Russian settlements on the shores of the Arabian Sea is merely a question of time; owing to her judicious treatment of the weaknesses and passions of the Central Asian nations, Russia has succeeded in acquiring great influence among them: can it be doubted, in face of these truths, that the overthrow of Afghanistan and the fall of East Turkestan, will follow, and that Russia will not rest till her eastern frontier line shall run parallel to the China Sea.* The consequences which must attend such an extension of Russia's sway in Asia are so obvious that we need not here enlarge upon them; but we are fully alive to the fact that her weight in Europe must necessarily increase to an overwhelming magnitude, and may afford her the power of realizing her plans in the West. Hence we would fain repeat that, in this respect, the interests of the continental powers are identical with those of England, and that the whole of Europe would do well, to veto Russia's ambition by a combined "Halt!" ere it be too late for words.

Every page in history bears witness to Russia's perfectly regardless system of utilization, by means of which she has ever understood how to turn complications to her own advantage. But it is not only the acquisition of lands it is also the possession of such points which bear upon the trade of Europe, that has an enormous influence in making the welfare of nations, and upon which even the material prosperity of a people may chiefly depend. The custom-boundaries *(Zollschranken)* which Russia has established between herself and Germany, may serve to indicate what her attitude would be, if she succeed in obtaining command over the main arteries of the traffic [of the world].

The aim of Russia's policy of conquest is to extend her sphere of power till it commence in mid-Europe and reach as far as the China Sea: to effectually counteract this, she must, in the first place, be stripped of the Caucasus and of the Polish belt of fortresses. Unless

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* [Owing to her prodigious wealth in coal, China would certainly prove a most valuable acquisition in the hands of any European nation. As to Russia in particular, her population will, at the present rate, double itself in less than 70 years, and the checks now preventing a still more rapid increase must, for decades to come, lose in force as the Russian nation will attain higher steps of civilization—a circumstance which must very considerably help to shape the future eastern policy of Russia.]—*Tr.*

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this can be achieved, it is difficult to conceive a method of checking Russia. The possibilty of doing it lies in the number and strength of the European armies, supported by England's navy: and in the disposition both of the Caucasian tribes and Poles.

So long, however, as Russia keeps possession of Caucasia and the Polish strongholds, she will neither forego her traditional policy of conquest, nor give up striving for the supreme command over the trade of the world, and must, therefore, continue a standing danger to the existence of all independent States and Nations.

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IV.

A SCHEME FOR THE PERSONAL EQUIPMENT OF THE SOLDIER, ON ACTIVE SERVICE, TOGETHER WITH A SYSTEM OF REGIMENTAL TRANSPORT.

BY

2ND CORPL. J. BROWNE BROWNE. R.E.,

8th Co., Bengal Sappers and Miners.

INTRODUCTION.

In introducing to public notice the following "Scheme for Personal Equipment of a Soldier in the Field and System of Regimental Transport; 2nd Copl. J. H. Browne Browne begs to offer ample Apology for any inaccuracies or defects therein; and trusts his humble position in the Service will be taken into consideration as explanation for such.

Not being able to have access to any Books of Reference on the subject except" Sir Garnet Wolsely's Soldiers Pocket book he has drawn in the main on his own personal experience and observation in

French Service Algeria 1866-69 and

Franco Prussian War 1870-71

Annual Training of Reserve of Norwegian Army 1873, and, more recently, in the British Service at home and in India.

His main object has been to render a soldier as comfortable as possible in the field, to provide for only such articles as are necessary for his comfort, and to enable him to carry a large supply of ammunition in the field, and have a considerable reserve under regimental arrangements close at hand, as required in modern warfare.

His position in the service may be taken as a guarantee of his knowledge of the requirements of the soldier generally.

The unit used in following calculations has been a section, reckoned at 30 all ranks on war footing, which will be found equivalent to half a troop of cavalry, or division (2 guns) of artillery.

A mule load has been assumed at an average of 180 lbs.

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It is assumed that in case of continuation of campaign, or severe work or exposure, additional supplies of clothing &c. will be obtainable through the Commissariat authorities.

The kind assistance of Lieut R. V. Phillpotts R.E. in giving numerous valuable hints &c. are herewith thankfully recognised.

Detail of Personal Equipment.

I.—Clothing.

	Weight lbs.	Weight oz.
Flannel-under ...	1	...
Shirt ...	1	...
Cholera-belt ...	...	2
Drawers ...	...	2
Socks ...	...	4
Boots ...	3	4
Leggings or Putties ...	...	10
Braces ...	...	3
Jacket ...	1	8
Trousers ...	1	8
Head-dress ...	...	12
Mitts ...	...	1
Total Weight lbs. ...	10	6

II.—Suspenders and articles in connection with them.

	Weight lbs.	Weight oz.
Great-coat (without cape)	4	...
Blanket ...	4	...
Waterproof Sheet ...	2	...
Balaklava Cap ...	...	4
Havresack ...	...	8
One Day's Rations ...	2	12
Towel ...	...	4
1 pair Socks, worsted ...	...	4
Soap ...	...	2
Oil Bottle, jag &c. ...	...	3
Comb ...	...	1
Bandage ...	...	2
Housewife ...	...	2
Fork and Spoon ...	...	4
Water bottle (filled) ...	2	8
Suspenders ...	1	12
Total Weight lbs. ...	19	2

III.—Arms and Accoutrements.

	Weight lbs.	Weight oz.
Pouches ...	1	12
Waist-belt and frog ...	1	...
Ammunition (80 rds.) ...	9	...
Rifle (Martini-Henry) ...	8	12
Bayonet and Scabbard ...	2	1
Clasp-knife and lanyard ...	...	5
Canteen with cover and straps ...	1	8
Tin pot and strap ...	...	2
Total weight lbs. ...	24	8

IV.—Recapitulation.

	Weight lbs.	Weight oz.
I.—Clothing ...	10	6
II.—Suspenders, &c. ...	19	2
III.—Arms & Accoutrements ...	24	8
Total weight lbs ...	54	0

Note.—The Great-coat, blanket and waterproof-sheet being intended to be carried by the soldier in exceptional cases only or on out-post duty, mounting outlying picquets and guards on active service, the above weight will generally be decreased by 10 lbs making the usual weight carried 44 lbs.

The Suspenders should always be carried as they materially conduce to the comfort of the soldier, by equalising and relieving the weight of ammunition, &c. on the waist-belt.

Description of Personal Equipment.

As, by experience, it has been found that, as a rule, men encumbered with packs when on active service avail themselves of the first opportunity to throw them away, and as it is highly desirable that men should

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come into action as fresh as possible, an equipment has been designed with a view to a man carrying only 80 rounds of ammunition with water bottle, one day's rations, socks and towel in havresack, canteen for cooking purposes, and tin pot for drinking; the great coat, blanket and Balaklava cap folded in waterproof sheet, being carried on the person for short distances only or on emergencies, such as mounting picquets, and outpost duty on active service, &c; provision for carriage in ordinary circumstances being made in first line of Transport which should always accompany the column.

The main features of this proposed pattern equipment consist of a pair of leather straps, similar in front to the braces of the present Valise Equipment, but coming straight down over the shoulders behind, joined in the centre of the back by a short connecting strap, and fastening by spring hooks to "*Ds*" let into the waist belt, both back and front, carrying two straps in lower extremities and two buckles in upper extremities for carriage of pack when required, and having loops for carriage of canteen.

The braces of the present Valise Equipment might easily be altered to fulfil, in a measure, the above conditions by letting studs into the back part of the waist belt, and attaching thereto the ends of the straps which at present fasten on to valise, the great coat and canteen straps being fixed as at present.

Ammunition to be carried in three (3) pouches, constructed so as to lie flat when empty; one to contain 40 rounds being, when without pack, carried between "*Ds*" at back of belt but shifted to front when pack is carried; and two smaller each containing 20 rounds, carried on waist belt in front as at present.

When the pack is carried, the canteen, which should always be covered, should be carried on belt, but without the pack, in loops of pack straps.

The jacket in wear should have four pockets, one in each breast and skirt, available for carriage of extra ammunition as necessary.

All officers and N. C. officers should have a pocket book and pencil on their person.

A clasp knife should be carried on left side of waist belt, connected by a lanyard and dropped into left skirt pocket.

A tin pot should be carried on right side of waist belt by a small strap, so as always to be easily detached.

Havresacks on left hip fastened by two straps passing through front and rear brace rings respectively and returning and fastening on themselves by hooks.

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Water bottle similarly on right side.

Leggings or putties to be invariably worn.

The articles proposed to be carried in havresack will be fond to tend considerably to the personal comfort of the Soldier and render him independent of all supplies for at least one day: bootlaces tobacco &c., at discretion.

As Khākī clothing is now almost universally adopted in our Service for active employment, it is advisable that both heavy and light clothing should be of that colour. thus obviating the inconvenience of wearing two suits at once and enabling the light suit to be made so as to fit more comfortably.

All straps should be of brown leather; buckles should be dull and if necessary covered with soft leather.

All buttons should be covered with cloth.

Trousers buttons available for jacket if provided with a guard of cloth and interchangeable.

The suspenders can be adopted for any branch of the service and might be found useful in the mounted services for equalising the weight and strain of the sword.

Bandsmen, buglers and pioneers should be armed with revolvers.

With proposed equipment all pioneer's tools at present carried on person can be dispensed with.

All followers to be entirely unarmed, escorts being provided whenever danger is apprehended.

Jemadars and duffadars to wear some sort of badge denoting rank and to be provided with whips.

Detail of Equipment.

Field Kit carried by 2nd Line of Transport.

Articles and weight.	lbs.	oz.	Remarks.
1 suit Khaki ...	1	...	When warm clothing is worn under Khaki this weight will be 3¼ lbs less.
4 pairs worsted Socks ...	1	...	
2 Shirts ...	2	...	The Waterproof kit bag should not be less than 30" long, similar in shape to Cavalry Valise, for convenience of carriage on pack animals if necessary.
1 Under-flannel ...	1	...	
1 Cholera Belt ...	...	2	
2 pairs Drawers ...	...	4	
2 Towels ...	...	8	"Sundries" include Writing Materials, Tobacco, Soap, Matches and Account book.
1 pair Boots ...	3	4	
1 suit Warm clothing ...	3	8	When kit bags are not waterproof, tarpaulins should invariably be provided.
1 Brush ...	...	8	
1 tin Dubbing ...	...	2	Pack-animals detailed for *Kits* should be furnished with Suleetahs.
Sundries ...	2	...	
Waterproof kit bag ...	2	...	10 Kits form a load for a mule or other similar pack-animal and 100 for a wagon, for detail of which see under "Transport."
Total weight lbs ...	17	4	

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Tools and Engineer Equipment.

I.

20 sets light entrenching tools, Chatham pattern, (pick and shovel) per Section, carried if practicable on pack-animals able to keep up with troops, requiring only one mule, weight about 7 lbs. per set.

II.—Per Company.

30 Shovels common.
30 Picks do.
2 Sledge-hammers 16 lbs.
2 Mammooties (for sanitary purposes).
4 American Axes (felling.)
20 Axes (hand).
4 Crowbars 4½' long.
4 ditto 2½ long.
100 Sand-bags light (150 lbs).

1 Measuring Tape 100'.
4 Tracing Tapes.
Mallet and Pickets.
1 Lantern.
Field Level.
1 Field Grindstone in case.

Picks and Shovels to be invariably carried on Pack-animals and transferred on occasion to 1st Line; otherwise when wheeled transport is available, remainder can with ease be carried in 1 wagon. Kajawas should always be at hand for transfer to pack-animals when necessary.

III.—Per Wing.

* Smith's Tools, assortment	...1	maund.
* Carpenter's ditto	..	ditto
* Armourer's ditto including material and oil	...	ditto
* Shoemaker's and Tailor's tools including materials for repairs, each	...	ditto
Steel, Iron, Tin, Copper and Zinc, &c. for solder and repairs	...	ditto
Nails, Spikes and Screws	...¼	ditto
Field Forge complete, about	...1½	ditto
Charcoal 100 lbs., or ...	.. 1½	ditto
Rope and twine ...	... 2	ditto
2 pairs Drag-ropes.		

Total weight 11 maunds, carried in 1 (one) waggon, the load being made up of Quarter-master's Stores, and pairs of Drag-ropes (light).

On examination, it will be found that the various articles comprised herein are of such quantities as will readily enable them to be made up into loads for pack-animals of about 2 maunds each.

* Including chests in each instances.

Tentage.

Tents should, as a rule, not be carried by an army in the field, troops should be more instructed than at present in the art of bivouacking, in fact, in civilized countries, sufficient shelter for the invading army would generally be available in the various towns and villages.

The best pattern tent in the British army seems to be that in possession of some of the Mountain Bateries in India, holding about 8 men, or considerably more in mild climates, and weighing about 1 md; two of which thus forming a convenient load for any ordinary pack-animal.

When used for hospital purposes, half the normal contents of each tent should be reckoned, and all such tents provided with tarpaulins for floor.

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Tents should, on the opening of a campaign, be left in rear and only brought up on formation of standing camps, semi-permanent posts and such like.

Ammunition.

		rounds	
In possession	per man	80	
1st Reserve	„	40	
2nd „	„	120	
Under regimental arrangements ...	„	240	Total.

All ammunition beyond this to be carried by, and in charge of the Ordnance Field Park. The 1st reserve to be carried on mules, 1 per section; 2nd reserve also on mules to be close in rear of each regiment, requiring per wing 48.

On the ammunition comprising 1st reserve becoming expended, the mules will be exchanged for a corresponding number of the 2nd reserve and as soon as possible sent to the rear for replenishment from the Ordnance Field Park.

All ammunition should be covered with tarpaulins, and a screw-driver for opening boxes should be attached to the pack saddle of all animals conveying ammunition.

Should it be requisite that the 2nd reserve should be carried on wagons, a certain percentage of mule straps should be provided and fastened round boxes to avoid delay in exchange of loads. A wagon will contain about 24 boxes, so that 2 wagons would be required per wing to carry 120 rounds per man.

Blankets.

A Reserve of one Blanket per man will be carried by the 2nd Line under Regimental arrangements in addition to the blanket in immediate possession of the men, and issued as required. In mild or hot climates these blankets may with advantage, be left at the base of operations.

Transport required	per company	3 mules
„	per wing	12 mules or 1¼ wagons
„	per battalion	24 mules or 1½ wagons.

Odd fractions of wagons available for carriage of additional warm clothing, or Quartermaster's Stores as may be advisable.

Water-carts and Puckals.

Whenever practicable, and whenever wheeled transport is employed, except in very exceptionable cases, water carts should always be employed in the proportion of two per wing; but where puckáls are necessary,

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two pairs are required per company. Bhisties to be employed as occasion requires, either with water-carts or puckáls.*

Packs and Cooking Pots.

The packs of the men (Great-coat, blanket, Balaklava Cap and Waterproof Sheet) should, be carried whenever practicable. 1 Wagon or 10 mules per company will suffice for this, and also allow of Cooking Pots being carried.

Cooking Pots should be made of Copper only when absolutely necessary, Copper Utensils are heavier than tin or iron ones and require careful cleaning and tinning periodically, any omission of which may be attended with fatal results.

Cooks should be entertained only in tropical climates.

Men should be encouraged to take pains with their own cooking and be able to cook in their canteens which should always be carried on the person and be provided with covers to save dirtying the men's clothes, and cleaning after each time of using.

Officer's Baggage &c.

One mule per company or One wagon per Wing should be allotted for Officer's Baggage, Arms of sick, and Office Materials, which latter should be reduced to the lowest possible dimensions.

No further addition to this scale should ever be necessary for detachments on account of the liberal scale of baggage transport allowed.

Rations.

Rations for all ranks for 3 days should always be available for immediate issue under Regimental Arrangements. One day's supply in possession of the men, and remaining two in charge of Quartermaster, carried in 3 wagons or 32 mules for whole regiment. If preserved or compressed provisions be carried, the weight will be considerably reduced.

A similar quantity of corn should also be provided for all pack animals and carriage provided for that purpose, when wheeled transport is employed, several day's corn for the horses can be carried without seriously increasing load.

Rations conveyed under Regimental arrangements should be issued on urgent occasions only, such as interruption of communication with Base, proceeding on detachment or other special duty on such short notice as to preclude obtaining supplies from Commissariat.

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* A proportion of spare water-carts and puckáls should always be in charge of Commissariat, available for detachments as required.

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Ordinary rations should as far as practicable be carried on pack-animals which would furnish the meat ration in the same proportion as bread and grocery rations.

An ordinary bullock in warm climates, and taken from work will furnish about 130 rations and carry about 166 lbs or the same number of bread and grocery rations.

Rum should be regarded only as a medical comfort, and issued only when troops are considerably exposed to bad and cold weather, and only then on the recommendation of Medical Officers.

Carriage of Sick, Hospital Arrangements.

Care of sick generally, including collection of wounded on the battle-field to be arranged for by divisions or brigades, but on a regiment being detached a proportion of Field hospital and Bearer Company could be attached.

Bandsmen should never be employed with Sick.

Empty returning carriage will always be available for conveyance of slightly wounded cases to the rear, thus leaving all hospital carriage proper, available for serious cases.

Bands.

Bands should never be broken up on active service, but only reduced to regulation numbers, supernumeries being employed with ammunition, but available for replacement of vacancies caused by casualties as required.

Pioneers.

Pioneers should be employed as store keepers of Tools and Engineer Equipment under Company arrangements.

Followers.

No followers of any description except Bhisties (when requisite) and Muleteers or transport-drivers should be allowed to accompany troops under fire, and these only in as limited numbers as possible.

Cooks when authorised should always be well in rear, but had better be dispensed with on all occasions of active service.

Escorts.

Escorts of the respective lines of regimental transports should be furnished by the units to which they are assigned.

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Convoys of supplies for Commissariat &c. from base should consist of Cavalry but should it be necessary or thought advisable to employ Infantry, they should be mounted on horses or mules, to enable them to cover longer distances than practicable when on foot with less fatigue, and to enable them to pass rapidly to various parts of the convoy tore-adjust loads when necessary, regulate progress and see that no distance is lost.

FOLLOWERS.

All followers of any army in the field, especially, those connected with Transport should be registered and numbered regimentally.

Muleteers and the like should be dressed uniformly, (kháki being the best colour) should have the number and badge of the regiment to which they belong on a back-ground the colour of the regimental facings in their head-dress.

They should also wear a badge on their breast (right for right wing and left for left wing) showing regimental number, and the letter of company to which attached.

Blankets for muleteers can always be carried by the mules without additional transport being required.

When wheeled transport is employed, drivers kits and bedding can always easily be carried under the driving seat.

Bhisties and other authorised follower's baggage should be reduced to the lowest possible scale, on no account exceeding 10lbs.

One jemadar per wing, with one duffadar and two lance-duffadars per company should be provided for any kind of transport.

With mules or other pack-animals, one man for three animals is sufficient, except for ammunition and puckáls which require one each.

Wheeled transport require one man per wagon, or pair of horses or mules.

The most suitable form of transport for an army in the Field seems to be that mentioned by Major General Sir Garnet Wolsely in his Soldier's Pocket Book, 3rd Edition, Part I. page 41 as used with the greatest success in the Red-River expedition, viz. light four-wheeled wagons drawn by 2 horses driven from the box, weighing 11¼ cwt. including pole and drag-chain, and carrying a load of 1,600 to 1,900 lbs.

Such a wagon would be equivalent to 10 mules and save an immense amount of supervision, and do away with the necessity of removing loads at every halt.

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Five per cent. spare should always be provided, which would be available for carriage of spare wheels, poles, &c. which should be interchangeable and provided at the rate of 10 per cent.

Each wagon should carry the driver's kit and bedding, two horse-blankets, 3 day's corn with 2 nose bags and usual incidentals as carried by the present pattern wagons of our Service.

Driving should invariable be from the box.

Half the horses should be fitted with breast harness, so that in case of any horse becoming unfit for work from collar-chafing, his services should still be available for breast-harness.

A few spare pairs of horses for lead purposes should always be available on hilly or heavy routes.

Drivers and wagons should be permanently attached to regiments on field service and the latter should be distinctly marked with the number of the regiment and number of wagon.

Horses should be requisitioned for on Commissariat as required, and exchanged when necessary.

Tarpaulins should be provided in all wagons for protection of loads in inclement weather.

Water-carts should be provided at the rate of four per regiment.

The class of transport above mentioned will always be able to go where artillery can and therefore answers all ordinary purposes, but for many things such as carriage of ammunition mules are preferable as they can be brought up closer to the respective units and do not present so great a mark to the enemy's fire.

Mules are also necessary in hilly country to obviate delay, and a few should always be provided even when wheeled transport is employed for use of small detachments not requiring an entire wagon.

Puckáls and 1st line of tools should always be carried on mules.

A few spare mules should be provided for the use of the Non-Commissioned Officers in charge.

Mules should invariably carry their blanket, line-gear and nose bag.

One officer per battalion
One N. C. O. per wing } required for supervision of transport.
One private per company

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TRANSPORT.

I.—WAGONS.

	Detail.	Per Company.	Per Wing.	Per Battalion.	Remarks.
1st Line.	Packs and Cooking Pots	1	4	8	* 1 for each detached company.
	Ammunition 1st Res. ...	1	2	4	
	Tools I. ...		2	4	
	Rations ...		2	4	
	Water Carts ...	*	2	4	Exceptional.
	Total 1st Line ...	2	12	24	Without spare, in ordinary circumstances.
2nd Line.	Ammunition 2nd Res. ...	1	5	10	
	Tools II.	1	3	5	
	Officers baggage ...		1	2	
	Kits ...	1	5	10	
	Tentage ...	1	4	8	
	Blankets ...	3	12	24	Exceptional.
	Total 2nd Line ...	7	30	59	Without spare, in ordinary circumstances, cold climate.
3rd Line.	Tools III. ...	1	4	8	
	Spare ...	1	5	10	To be distributed as required.
	Total 3rd Line ...	2	9	18	

I A.—SUMMARY OF WAGONS.

1st Line ...	**2**	**12**	**24**
2nd Line ...	**7**	**30**	**59**
3rd Line ...	**2**	**9**	**18**
Spare ..	**...**	**...**	**4**
GRAND TOTAL ...	**11**	**51**	**105**

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II.—Mules.

1st Line.	Packs and Cooking Pots.	10	40	80	
	Ammunition 1st Res. ...	4	16	32	
	Tools I. ...	4	16	32	
	Rations ...	4	16	32	
	Puckals ...	2	8	16	Exceptional.
	Total 1st Line ...	24	96	192	Without spare, under ordinary circumstances.
2nd Line.	Ammunition 2nd Res. ...	12	48	96	
	Tentage ...	8	32	64	
	Kits ...	12	48	96	
	Tools II.	6	24	48	
	Officer's baggage &c. ...	1	4	8	
	Blankets ...	3	12	24	Exceptional.
	Total 2nd Line ...	42	168	336	Without spare, under ordinary condition in cold climates.
3rd Line.	Tools &c. III.	2	6	12	
	Rations (mule) ...	4	16	32	Exceptional.
	Spare ...	4	16	32	For distribution as required.
	Total 3rd Line ...	10	38	76	

II A.—Summary of Mules.

Total 1st Line ...	24	96	192	Always with regiments.
Total 2nd Line ...	42	168	336	1st Baggage Train General.
Total 3rd Line ...	10	38	76	Always at hand.
Grand Total ..	76	302	604	
Add Spare ...	...	...	6	Incidentals.

6 extra mules making total of 610 per battalion required for use of N. C. O.'s in charge of transport.

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V.

MILITARY REFORMS IN INDIA.

By Colonel A. R. Gloag, Royal Artillery.

Ne-quid falsi dicere audeat, ne-quid veri non audeat.

Having just risen from the perusal of an Article in the issue of the "*Pioneer*" dated Monday 22nd December 1879, headed *The Army Commission*, I have been moved thereby to reproduce some questions which I treated anonymously as far back as 1862, and have adapted them to the present condition of our Indian Military System, which is allowed to be utterly unsuited to the times in which we live. As far back as 1860 indeed, it was becoming abundantly manifest, that our Military machine in India, was entirely out of gear. This opinion, I now learn from quotations in the "*Pioneer*" article, appears to have been held by such able men, as the late lamented Prince Consort, Lord Lawrence, Sir W. Mansfield, Sir C. Trevelyan, Sir Henry Durand, Sir H. Tombs, and Colonel George Chesney. Some years ago, when conversing with a very distinguished, and highly popular Officer, on the question of the abolition of the separate Armies of Madras and Bombay, he said to me "why if you do away with these Army Commands, and their "different staff appointments, you leave but little for deserving, and distinguished old Officers to fall back upon, when no longer sufficiently "active to take the field." I replied, "the revenues of India cannot long stand "the expense incident upon maintaining three separate Armies in "India and three separate Commanders-in-Chief, with their separate "sets of staff appointments, and Departments; it would therefore be "wiser and more reasonable to pension all distinguished old Officers "at specially high rates, and relegate them to comfortable retirements, "when no longer fit to perform the active duties of their professions; "they might then, while living at their ease, prove able advisers of the "War Minister of the Crown, on all Military questions."

The days of Octogenarian Military Commanders passed away with the Great Duke of Wellington, as Molière says "*nous avons changé tout cela*," and now we see such active, and intelligent, *young* Generals as Sir G. Wolseley and Sir F. S. Roberts exercising high commands. I do not pretend to be infallible, I do not think my opinions better than those of every one else, the only favour I would ask is a hearing, with "*the magic of patience*" well thrown in, pardon for many of the imperfections that may creep into my paper, and a dismissal from the minds of all those who may take the trouble to peruse these lines, of the narrow prejudices which were the offspring of the Three Presidency Military System, and which even now flourish in our midst, notwithstanding

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the sad experiences of the past, so lucidly detailed by the late Prince Consort, and quoted by the "*Pioneer*" as follows.

"We have hitherto had in India not only a different system for each "Presidency, and independent, or nearly independent command in each, "but in each of these three independent Armies *four independent* "*kinds of forces. The Queen's European, The Company's European,* "*The Regular Native, and the Irregular Native Armies!* Under this "state of things, the result has been, the Mutiny of the whole Native "Army of one Presidency, and the state of discipline in the *local* "*European troops,* characterized as disgraceful, by some of the most "competent judges on the spot, and *nothing but jealousy and animosity* "*between the different services!*"

I must leave every impartial Military man to say for himself *how much* of this spirit of jealousy, and animosity still leavens the Armies of the three Presidencies, in this paper I will make no further allusion to this subject. The late Prince Consort laid down the following principles in regard to Military systems which govern Armies, these principles should be written, in imperishable letters, over every Military Office in the British Empire.

"*The great principles on which the efficiency of the Military force* "*in any Country and under any circumstances must depend are* "*simplicity, unity, and steadiness of system, with unity of* "*command.*"

Tried by this standard the Three Presidency system, is simply a triumph of wrong over right, but surely, as heretofore, such a triumph cannot be of long duration, however much it may have conduced to the benefit of some. The fact that it is one of the chief Military Causes of our present financial difficulties, will ere long be made evident, and then it must die a natural death. It is a very difficult task to write on this subject of *Military Reform*, without seeming to be intensely egotistical, and satisfied with one's own opinions, and while standing forth as a general reformer, so to speak, run the risk of making many brother officers, whose friendship, and confidence are absolutely requisite for the attainment of happiness in the Military profession, more than in any other profession, enemies instead of friends.

The first principle which should be observed therefore, in order to avoid such a catastrophe is to treat of *systems* not of *individuals*, to write about *subjects*, and not about *persons*, so as to maintain *a cordial unanimity* with all one's professional associates, be they superiors, equals, or inferiors. If this *cordial unanimity* does not exist in the Military profession, *then is all reform hopeless.*

If by any chance in what follows there may appear the slightest semblance of *personalities*, I must plead in extenuation that "*it is but human to err.*"

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I would with all the energy of expression at my command deprecate the re-introduction of *a local European Army*, and the retention of the *Three Presidency system*; the former is against nature, as well think of localising Hippopotami in the "Zoo," as of localising European troops in India. They were necessary evils in the early days of the East India Company, when *Communications* hardly existed now-adays they have no further claims for existence; and the three Presidency system is but a medium for dispensing patronage. Such systems have been utterly condemned by the opinions of an overwhelming majority, and it is almost impossible to conceive, that the first can be re-introduced or the second any longer retained. I will now classify my subject under six heads and deal separately with each, and finally sum up my veiws as briefly as possible.

FIRST. *The condition of the Army in India, its location and distribution, the method of carrying out its reliefs, its payment and clothing and its routine work are unsatisfactory.*

SECOND. *The financial condition of India is unhealthy.*

THIRD. *The power of further borrowing money in India has ceased.*

FOURTH. *The loss by exchange has been steadily progressive, and threatens to become a very serious financial difficulty.*

FIFTH. *It has become necessary, to borrow money in England to be applied to expences in India, and to introduce into the latter an income tax, when the burden of taxation is already greater than the people are able to bear.*

SIXTH. *The expenditure is needlessly excessive, whereby large reductions and retrenchments have forced themselves upon us in order "to bring back the equilibrium of revenue and expenditure."*

When treating of the subjects indicated under the first head, it will be necessary to go back to "the days of old," before there had been any such Military disaster as the great Mutiny of the Bengal Army, which broke out in 1857-58, and then proceed to compare the past and the present, drawing our conclusions, from differences in past and present conditions. In the days prior to the Mutiny there were four kinds of Troops in India, Queen's European Troops, Company's European Troops, Native Regulars and Native irregulars. These were divided into three separate armies, governed by different rules and regulations, differently dressed, and differently equipped. Commanded by three chiefs, almost entirely *independent* of one another. The Company's European Troops were purely local in each army, as were also the Native regulars and irregulars. The former, in all three Presidencies, passed away by what has been called "The white Mutiny," rather a harsh term to apply to men who had agreed to serve one

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master, and were to be transferred, without any compensating bounty or privileges, and without their consent, to the service of another master. Perhaps the world had never witnessed before the days of "*John Company*," such a wonderful spectacle, as these Native local regular, and irregular armies, composed as they were of Natives of India, led by English Officers, fighting against their own countrymen, and helping to bring the land of their birth under a foreign yoke. These armies were simply composed of mercenaries fighting for good pay, regularly disbursed. Under these conditions a convulsion of some kind was, sooner or later sure, to be evolved, and it came with terrific violence on 11th May 1857, heralded by unmistakable signs, if only some men had not been singularly infatuated, and so rendered blind to events which were daily occurring under their very eyes, and at their very doors. In this convulsion the Bengal Native Army passed away for a time.

It was quite impossible that any national or patriotic feelings or motives could exist in armies so constituted. The Company's European Troops, must also be classed as mercenary troops of the best kind, fighting for good pay, and certain privileges, but I think it must be allowed that they could hardly be looked upon as serving *Their Queen* and *Country* prior to 1857, as they had no connection with England, and were not liable to serve in European Campaigns they therefore had not much room for the display of patriotic motives, or feelings although like all Englishmen, they were brave, and always fought well. When the Company of Merchants of London first traded to the east, armies were not thought of, they arose out of the exigencies of the times and when established, their early history, and some subsequent doings, did not meet with unqualified approval in many influential quarters at home. It may therefore be taken for granted that the armies of India (the local armies are here meant) prior to 1857 were not altogether in a satisfactory condition. The reliefs in those days were carried out locally under Presidency arrangements, in a very simple manner, as reliefs marched from one place to another as circumstances, and expediency dictated. The location and distribution of the armies in India were not in those days such important questions, from a financial point of view, as they have now become; more especially as communication, between place and place, except by long and tedious marches over simple cart tracts, did not exist. We must now carefully study our maps of India published in 1850, and compare the travelling experiences of those days, with our present experiences in these days of Telegraph, Railway and Steamboat communications of the most perfect kind. This is one of the most important questions bearing upon Military expenditure in India. While, as I will presently shew, hardly any means of communication existed in India prior to 1850 doubtless the three Presidency system, was the most suitable, and the most economical. When it took as many months, as it now requires but days to travel from one end of India to the other, the method of confining each army under ordinary circumstances within presidential

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limits was a wise, simple, and efficient plan. But since the introduction of Telegraph, Rail, and Steamboat communications this system became a vicious one, and has resulted in extravagance, confusion, and an extraordinary waste of time. It must also be borne in mind that, prior to the Mutiny there were only some 30,000 European troops in India including Queen's and Company's troops. Subsequent to the Mutiny the Queen's troops were raised to 85,000, and the number now seldom goes below 65,000 men; and this is liable at any moment to increase. After the Mutiny the native army of Bengal was reconstructed, the principal alteration in its condition was a reduction in each Regiment of the number of its European Officers, more power being given to the native officers, somewhat on the irregular system. This plan was gradually indroduced at Madras and Bombay, and I think it will be allowed by almost all the officers of these armies, that it conduced most materially to the deterioration of Regiments. Surely if a British Regiment requires a large proportion of officers, which it does now more than ever, since the introduction of extended lines in fighting, and breech loading long range rifles, a native Regiment requires even a greater proportion of European Officers, to give it confidence, lead and control it, more especially in action. As it is, ammunition is profusely thrown away in action, more certainly is this the case, when there are a number of young soldiers in a Regiment.

Turn we now to our Indian map, say one published in 1850. Taking our start from Palamcottah we find that there was no railway communication, and no telegraph wires laid on, between this our most southern Indian Military station, and Peshawur, our most northern outpost. We had no coasting steamers, save and except the old "*Hugh Lindsay*" a most uncomfortable as well as doubtful vessel, and the not very splendid steamers, and sailing vessels, of the East India Company's navy, that is, if we compare them with the East Indian Transports, and our War, and coasting steamers of to-day. Postal communications were defective, and uncertain. The method of travelling was very tedious and slow. To go from Palamcottah to Peshawur, occupied the major portion of a year. It will be in the recollection of many now serving in the Army, how difficult it was to despatch troops "up country" in 1857/58, and after all the fuss that has lately been made about War Correspondents, and public information on Military matters during a Campaign, it will not be forgotten, how defective was all our intelligence on these questions during the great Mutiny.

Those desirous of having their memories refreshed can find ample means of doing so in the pages of Colonel Malleson's history of the Indian Mutiny and they will learn that our Officials had then, like moles, to work almost in the dark. Our communication with London by letter occupied about a month, we had no Suez Canal, and we had to send our troops round the Cape of Good Hope, losing the services of some 5000 men every year, who went down to the sea in ships, and made their home, like the sea gulls, in the great waters. No telegraphic

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communication with England existed. Turn we now to the other side of the picture, as it is seen in these days of rapid communication, so. rapid indeed that it vies with the lightening's flash in speed. In the matter of Railways and telegraphs in India, the dawn of their existence will ever render the year 1851 a memorable one in the annals of our Eastern Empire; this year witnessed the commencement of these two means of communication, in two, out of the three Presidencies. At Calcutta and Bombay the first sections of the *East Indian* and *Great Indian Peninsular Railways* were put in train; whilst an electric telegraph was begun between Calcutta and Diamond harbour, the first few miles of our now enormous extent of 40,000 miles of wire, the receipts on the making of which at present amount to about £300,000, and the expences of making average £270,000 per annum. In 1854 there were but 21 miles of Railway open for traffic, in 1879, there were a little over 8600 miles. The number of post Offices in 1868 was 3159, in 1879, about 10,000 including the late introduction of pillar posts and letter boxes, in these years respectively there passed through the post Offices 69,154,847, and 123,541,753 letters and newspapers.

The revenue and expenditure did not alter much with these increased numbers, owing to the great reduction effected in the rates of postage.

Taking our start on the map of India published on 1st January 1880, from Palamcottah and Tuticorin, in the 8th degree of North latitude, we find that these places are in direct Railway, and telegraphic communication with Jhelum in the 33rd degree of North Latitude, and that ere long the line of Railway will be completed to Peshawur, *and eventually to Jellallabad, Kabul, and Herat.* Every principal Military Station where Troops need be cantoned, save and except the several Hill plateaux, are in direct Railway Communication with each other, and we have telegraph lines for all practical Military purposes, *everywhere*!

The most direct line of Rail from Tuticorin, to Jhelum, passes through Erode, Arconum, Dhond, Munniad, Jubbulpore, Allahabad, Dadree, and Lahore, that is a distance of about 2700 miles, which, going at the easy rate of say 12 miles an hour, would be traversed in about 9 days. By special arrangements this distance might be done under 7 days, thus what took us the major part of a year in 1854 to travel over is now done in a little over a week, indeed for "months," we may safely write "days."!

Under no conceivable circumstances would it be necessary however to move any large body of troops over this entire distance, as troops can easily be concentrated on any given point from both ends of all lines of Railway. We must not omit in our review the important province of British Burmah, the communications in which, since our acquisition in 1852, have progressed marvellously, by road, river, and rail, and are bound to progress ere long even more rapidly. We have also the

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combined Sea and Railway routes admitting of troops direct from the Mediterranean, England, and elsewhere being landed on the coast of India, eastwards at Tuticorin, Negapatam, Porto Novo, Madras, Pondicherry and Calcutta; westwards, at Calicutt, Bombay, Sunjan, Surat, Broach, Wassud, Patree, and Kurrachee, all these places being in direct Railway and telegraphic communication with each other, and our frontier outposts in the north. For these combined sea routes, we have the Suez Canal, our splendid "Troopers," and England's magnificent and unrivalled Merchant navies, with the coasting steamers of the enterprising British India Steam Navigation Company, and others, running weekly round the entire Coast line from Rangoon and Moulmein, to Calcutta the Northern ports, Madras, and the Andaman Islands, and up the west coast viâ Galle to Bombay and Kurrachee. Finally we are, so to speak, in momentary communication with London, and the uttermost parts of the earth by means of the Electric telegraph. I may therefore say our means of external and internal communications, are for all practical purposes, *unlimited!* Who then can be bold enough to stand forth and say *honestly* that he believes it is absolutely necessary, as the *Pioneer* so tersely puts it "*to throw away many millions*" in an obsolete and effete system! Who will not rather prefer to say,

"Men change with fortune, manners change with climes,
"Tenets with books and *principles with times!*"

It appears to me that we have for long, indeed for a dangerous length of time, ignored the fact that *all our principles,* in affairs Military, *have changed,* have grown old, grey, and worn out, and still we have kept on working our wheezy, creaking, and crazy machine called "*The three Presidency system*" so forcibly condemned by the lamented Prince Albert. If this far seeing statesman had only been spared to the nation he loved and adopted as his own, how different might have been the aspect of Military affairs, and our Indian finances at the present day. As regards revenue matters too, the actual sums spent on the army have increased astonishingly since 1850 and with but little advantage to the efficiency of the Military services, *so much has been absorbed by increased departments, which need never have been introduced.* I think I have now said sufficient on the subject of our means of communication at the present day. Before going further I may add that I am unable to see that any improvement worth mentioning has taken place in the construction and equipment of the native armies of India, since the great Mutiny, except perhaps in the matter of rifles and head dresses. The Madras and Bombay sepoys are still absurdly dressed, for field service at any rate. In this respect the Bengal Army is very much ahead of them. Again the irregular system, which was introduced into Madras and Bombay, has lessened the efficiency of the native regiments of these armies. The cost of the armies of India, the year prior to the Mutiny amounted to but £12,000,000, and rose just after the mutiny to its highest figure viz £25,000,000, or just about half the net revenue of the Empire; in 1876-77 their maintenance cost close on £16,000,000, and we can hardly

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under our present cumbrous system put the expenses much short of £17,000,000, without exercising the most rigid economy.. There were, and still are almost the same proportion of faults in the three native armies of India, no good results could however accrue by entering into comparisons. What we are concerned with is the abolition of the three Presidency system, and the reconstruction of but one native army, under one Commander-in-Chief in India, welded into one united and homogeneous whole, melting down and fusing all absurdities and jealousies in the crucible of *true reform*, each regiment being allowed to retain its ancient halo of prestige, regular and irregular, designated by the name of the province in which raised or from whence it obtains recruits, all dressed suitably, and regularly numbered, ready to serve wherever they may be required, and under one Code of Military Regulations. Each Regiment might be distinguished by outward and visible signs, such as facings, or badges, just as our British Regiments are distinguished.

I will now proceed to give a brief discription of the distribution and location of the 3 native armies of India as they at present exist, and I may note in passing, that, notwithstanding our increased means if intercommunication, this distribution and location, is much the same as it was a quarter of a century ago. I may add too, that the native armies of Madras and Bombay are not composed of the same class of men as of yore. Our rule has been one of peace and good will, latterly at all events, therefore the people have ceased to be warlike, and have deteriorated in physique in these Presidencies. We now come to the subject of the location of each Army in its own Presidency.

Bengal.

Stations.	Remarks.
1. Umballa	Sirhind Division.
2. Sealkote	2nd class Brigade.
3. Segowlie	Station.
4. Lucknow	Division.
5. Deolee	Station.
6. Nowgong	do.
7. Sutna.	do.
8. Seetapore	do.
9. Fyzabad	do.
10. Morar	1st Class Brigade.
11. Mooltan	2nd class Brigade.
12. Meerut	Division.
13. Peshawur	do. 1st Class Brigade.
14. Nowshera	Station.
15. Cawnpore	do.
16. Jhansi	do.
17. Allahabad	Division.

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Stations.	Remarks.
18. Barielly	1st Class Brigade.
19. Roorkee	Station.
20. Benares	do.
21. Dinapore	do.
22. Berhampore	do.
23. Bhaugulpore	do.
24. Nya Doomka	do.
25. Futtehghur	do.
26. Agra	2nd Class Brigade.
27. Meean Meer	Station.
28. Julpigoree	do.
29. Dacca	do.
30. Rawulpindee	1st Class Brigade.
31. Fort William	Station.
32. Buxa	Station.
33. Quetta	2nd Class Brigade.
34. Delhi	Station.
35. Cachar	Station.
36. Barrackpore	1st Class Brigade.
37. Alipore	Station.
38. Goruckpore	do.
39. Shillong	1st Class Brigade.
40. Debroghur	Station.
41. Gowhatty	do.
42. Kohat	do.
43. Abottabad	do.
44. Edwardesabad	do.
45. Dera Ismail Khan ...	do.
46. Murdan	do.
47. Dera Ghazi Khan	do.
48. Augur	do.
49. Goonah	do.
50. Deolee	do.
51. Erinpoorah	do.
52. Sirdarpoor	do.
53. Kherwarah	do.
54. Bolarum	do.
55. Aurungabad	do.
56. Hingolee	do.
57. Ellichpore	do.
58. Mominabad	do.
59. Lingsagoor	do.
60. Jaulnah	do.
61. Lahore	Division.
62. Saugor	1st Class Brigade.

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We must now see how these stations communicate with one another, and the nature of the people that surround each, and their proximity or otherwise to independent native states and their armies. As we have seen the principal stations, except Peshawur are connected with each other by Rail, such as Umballa, Lucknow, Mooltan, Lahore, Meerut, Cawnpore, Allahabad, Benares, Agra, Delhi, as are also many of the minor stations; and all are within easy distances of the telegraph. The Army of Bengal, Native regular, and irregular, and contingents, distributed over the presidency, and located in the above mentioned stations, consists of the following troops.

33 Cavalry Regiments strength in Combatants ...	13,871
9 Batteries, Native Artillery do.	1,163
Sappers excluding Europeans do.	1,160
74 Regiments Infantry regular and irregular do. ...	50,000
Total Combatants	66,194

This Army is nearly the same as it was before the Mutiny, the regular native Artillery called Golundauze was however swept away. The native Batteries are all now irregular, belonging to contingent levies. These troops are classified as follows in Hart's Army List for 1879.

19	Regiments of Regular Cavalry.		
5	do.	Punjáb do.	
1	The Corps of Guides	do.	
2	Regiments Central India Horse.		
1	do.	Deolie irregular Lancers.	
1	do.	Erinpoorah. do.	
4	do.	Hydrabad Contingent Cavalry.	
10	Companies Sappers.		
4	Hydrabad contingent Artillery Batteries.		
5	Batteries Punjab Artillery.		
45	Regiments Regular Native Infantry.		
5	do.	irregular do.	Goorkas.
1	do.	do. do.	Guides.
4	do.	do. do.	Sikhs.
6	do.	do. do.	Punjab.
1	Regiment Deolee Irregular Infantry.		
1	do.	Erinpoorah do.	
1	do.	Resident's escort Khatmandoo, Infantry.	
1	do.	Malwah Bheel Corps	do.
1	do.	Meywar do.	do.
1	do.	Bhopaul Battalion	do.
1	do.	Mhairwarr Battalion	do.
6	do.	Hydrabad Contingent	do.

The Bengal Army on 1st January 1879, was divided into the following commands.

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10 Divisions commanded by Lt. Generals, and Major Generals.

6 First class Brigades commanded Major Generals and Brigadier Generals.

18 Second class Brigades, commanded by Brigadier Generals.

Total 34 General Officer's Commands, leaving about 28 station commands for Colonels, and other senior Officers, who being seniors on the spot, commanded the Garrisons, at the same time doing their own proper Regimental duty on regimental pay only! All the above Regiments, are provided with European Officers from the Staff Corps, and from "locals" indiscriminately.

The number of officers in the local service is for Bengal, Generals 22, Lt. Generals. 7, Major Generals 6, Colonels 36, Lieut. Colonels 46, Majors 18, Captains 2.

The number of Staff Corps Officers is,
Generals 12, Lieut. Generals 14, Major Generals 19, Lieut. Colonels (including Brevet Colonels) 278, Majors 251, Captains 188, Lieutenants 233. Did the original founders of the Indian Staff Corps ever contemplate *such a result* as this? viz 709 Field Officers, as against 190 Captains and 233 Lieutenants. Can any thing in Military history compare with this as a *reductio ad absurdum?* The amount of money actually paid to these Officers will presently be exhibited approximately.

A very large proportion of the senior Field Officers, live in England of course, and are no longer desirous, or perhaps able to perform any duty, Civil or Military, they have done their work, in a very large proportion, nobly and well, and they have entered into their rest. A considerable member are and have been doing civil duty for many years, but the great point to note is *the excessive number of Field Officers and the paucity of Subaltern Officers.*

We come now to the Madras Army, its strength and location within presidential limits.

MADRAS.

STATIONS.	REMARKS.
1. Palamcotta	Station.
2. Quilon	Station.
3. Trichinopoly	Station.
4. Calicutt	do.
5. Manintady	do.
6. Cannanore	1st Class Brigade.
7. Mangalore	Station.
8. Mercara	do.
9. French Rocks	do.

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Stations.	Remarks.
10. Bangalore	Mysore Division.
11. Fort St. George	1st Class Brigade.
12. St. Thomas Mount	Madras. Station.
13. Pallaveram	Madras. do.
14. Poonamallee	Madras. do.
15. Bellary	1st Class Brigade.
16. Kurnool	Station.
17. Secundrabad	Hyderabad Division.
18. Vizianagram	Station.
19. Kamptee	1st Class Brigade.
20. Rangoon	Division British Burmah.
21. Moulmein	Station.
22. Andaman Islands	do. Convict settlement.
23. Thyetmyo	do.
24. Tongoo	do.

We must now see how these stations communicate with each other, and with Northern India, and the nature of the people that surround each, and their proximity or otherwise to independent states and their armies.

The chief stations of Bangalore, Kamptee, Secundrabad, Bellary, Madras and Trichinopoly are all connected by rail with each other and with Jhelum, Rangoon, Moulmein, and the Andaman Islands, are all within short distances of Madras and Calcutta by sea route, the furthest being only 85 hours steaming at most.—Thyetmyo is 13 hours distant from Rangoon by rail and river steamer route, and 10 days march across to Tongoo, the latter is 10 days by boat, and 12 days march from Rangoon. The land journeys are through jungles, where, in many places, the roads are not adapted for wheeled traffic. All, or nearly all, stations in the Madras Presidency are within easy distance of telegraph offices. The Madras Army now consists of the following troops. After the Mutiny it was very much reduced, rather perhaps a curious proceeding as this Army remained "true to its salt" during the hard times of 1857/58. It might therefore have been employed in the North, and not so reduced. It was however a wise measure to reduce the Divisional Commands from 9 to 3, and Brigade Commands from 8 to 4.

	Combatants,
4 Cavalry Regiments about	1,500
10 Companies of Sappers excluding Europeans ...	1,212
40 Regiments Infantry	28,520
Total Native Army ...	31,232

There are no irregular Regiments as in Bengal so the detail ends here. The Golundauze were swept away as in Bengal.

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The Madras Army on 1st January 1879, or very shortly after that date was divided into the following Commands.

3 Divisions commanded by Major Generals,
4 1st class Brigades by Brigadier Generals,
Total 3 Major Generals, 4 Brigadier Generals.

The rest of the stations were commanded by the senior officers present, without extra pay in addition to doing their own proper Regimental duty. The Madras Regiments have been assimilated to the Bengal irregular system, and are provided with European officers from the Staff Corps and locals indiscriminately. The number of local officers is, Generals 19, Lieutenant General 1, Major Generals 11, Colonels 15, Lieut. Colonels 34, Majors 17, Captains nil, Subalterns nil.

The number of Staff Corps Officers is, Lieutenant Generals 5, Major Generals 12, Lieut. Colonels (and Br. Colonels) 233, Majors 217, Captains 53, Lieutenants 30. The total numbers are 467 Field Officers, as against 83 Captains and Subalterns. This was hardly contemplated by the founders of this system surely. The same remarks already applied to Bengal apply equally to Madras.

We come now to the consideration of the Bombay Army.

BOMBAY.

STATIONS.	REMARKS.
Mhow	Division.
Ahmedabad	do.
Poona	do.
Bombay	Brigade 1st Class.
Kurrachee	Station.
Hydrabad Sind	do. 2nd class
Belgaum	do. 1st class.
Nusseerabad	do. 2nd class.
Deesa	do. do.
Aden	Brigade 2nd class.
Neemuch	Station.
Seroor	do.
Jacobabad	do.
Rajkote	do.
Kirkee	do.
Kolapore	do.
Satara	do.
Bhooj	do.
Dharwar	do.
Mallegaum	do.
Ahmednugger	do.
Surat	do.
Baroda	do.
Mehidpore	do.

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The same remarks apply to this Army as have been applied to the other two, they will all be treated hereafter as a whole. All the communications, with a few exceptions, such as Deesa, Neemuch, Jacobabad, Dharwar, are complete by rail, and in a very short time hence, they will be in direct railway communication with all other principal Military Stations. Telegraphic communication is complete.

There are 3 Divisional Commands held by Major Generals, two 1st class, and four 2nd class Brigades held by Brigd. Generals, and 15 Station Commands held by the senior officers present on the spot.

The Bombay Army consists of the following troops.

7 Regiments of Cavalry strength	combatants,	...		4,158
1 Aden Troop,	do.	...	...	101
2 Mountain Batteries Artillery,	do.	...	...	243
5 Companies Sappers,	do.	...	...	535
30 Regiments of Infantry,	do.	...	...	21,570
	Total of all		...	26,577

There are so few irregulars in this Army, that our detail may end here. These Regiments are as in the Regiments of the other Presidencies, furnished with European Officers on the irregular system from Locals and Staff Corps Officers, indiscriminately. The number of local Officers is Generals 9, Lieutenant Generals 3, Major Generals 4, Colonels and Lt. Colonels 22, Majors 12, Captains nil, Lieutenants nil.

The Staff Corps has Generals 6, Lieut. Generals 4, Major Generals 5, Colonels and Lt. Colonels 174, Majors 102, Captains 50, Lieutenants 85. That is 341 Field Officers and only 135 Captains and Lieutenants, this although not quite such a glaring absurdity as the other two cases, is sufficiently absurd to demand a reconstruction, on sounder principles. We will now put these three separate Armies into one total, and we find the combined numbers as follows.

Native Regulars and Irregulars,

44 Cavalry Regiments	Combatants,	...	...		15,887
11 Batteries of Artillery	do.	...	...	...	1,406
25 Sappers (Companies)	do.	...	...	...	2,877
144 Infantry Regiments	do.	...	...	...	100,090
					120,250

This army is divided into 16 Divisional Commands, 12 Brigade Commands 1st class, 22 Brigade Commands 2nd class, 78 Station Commands, requiring 16 Lieutenant and Major Generals, 34 Brigadier Generals, 78 Colonels and Lt. Colonels. We have also 188 Regiments of Cavalry and Infantry, requiring that number of Colonels and Lieutenant

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Colonels, 78 of whom however have been shewn as Commanding Stations as well as their Regiments, therefore we require for the above army 110 more Colonels and Lieut. Colonels.

	Recapitulation
Lieutenant Generals and Major Generals	16
Brigadier Generals (*i. e.* Colonels)	34
Colonels and Lieut. Colonels for Regiments and Stations	188
Total, ...	238

1 Commander-in-Chief Bengal and India,
1 do. Madras,
1 do. Bombay,
3 Total—Generally Officers of the Imperial Lists, the only Company's Officers, who, regularly have held these Offices, are Lord Napier of Magdala Bombay, Bengal and India; Sir Patrick Grant and Sir Neville Chamberlain Madras.

The total number of Locals, and Staff Corps Officers for the whole of the Native Army of India is as follows,

	Recapitulation,
Generals	68
Lieut. Generals	44
Major Generals	57
Colonels and Lieut. Colonels	838
Majors	617
Captains	293
Lieutenants	402
Total of all Ranks, ...	2,369

Out of this number of Officers the following are employed on actual Military Staff, and Regimental duties. One General Officer Commanding the Madras Army.

Generals Comg. Divisions	6
Brigd. Generals *i. e.* Colonels Comg. Brigades ...	19
Colonels and Lt. Colonels Comg. Regts. and Stations	188
Generals on the Staff	Nil.
Colonels and Lt. Colonels on the Staff	21
Majors do. and Regiment...	211
Captains do.	159
Lieutenants do.	204
Total Militarily employed Staff, ...	808

We have therefore actually employed on the Staff of the Army and in command of Regiments and Stations, and doing Regimental duty 808

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Officers out of a total number of 2369 Officers, the remainder 1561, are on leave, unemployed, or doing civil duties.

We have therefore Three Native Armies, under three Commanders-in-Chief aggregating 808 Officers, and 120,250 men, with 16,000 horses, mules and camels, and 48 Mountain and Light field guns. Averaging 1 European Officer to about every 150 men, including all ranks of combatant Officers and men. By the latest parliament returns at my disposal, it appears that the Armies of independent Princes and chiefs amounted to the following numbers.

HYDERABAD DECCAN,	
Cavalry	8,203
Guns	725
Infantry	36,890
BUNDLECUND,	
Cavalry	2,677
Guns	421
Infantry	22,163
CASHMERE,	
Cavalry	1,393
Guns	96
Infantry	18,436
GWALIOR,	
Cavalry	6,000
Guns	210
Infantry	16,050
KATTYWAR,	
Cavalry	4,000
Guns	504
Infantry	15,300
OODEYPORE,	
Cavalry	6,240
Infantry	15,000

Not specified 11,000 men. Grand total 315,000, with an Artillery of 725 Guns—of large size, Calibres not given.—It is true that we have a large force of Military police, urban and rural, well armed and drilled as a kind of Militia, the munerical strength, and constitution of which it is not easy to determine, nor yet its actual military value. As long however as we tolerate an independent number of native Armies aggregating the above formidable numbers, so long will it be requisite for us to maintain a large native Army, watched by a large European Army. By latest returns these independent Armies are 1.75 times larger than ours, and their Guns are as 725 to 48, theirs being described as of large size. It may be impossible to get these armies disbanded, but if it could be done and we could recruit from among the disbanded soldiers for our own Native Army, the result would be both safe and economical.

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It would seem however as if no such step appeared feasible, as we are proposing to hand over our smooth bore guns to the independent Princes and Chiefs, as soon as they are replaced by later patterns of rifled ordnance. These Armies and their Chiefs may be very loyal, and true to us, but from an Oriental point of view, sheer strength is our only real safe guard, and we must ever remember the fact, "we came" "into possession by the sword, and by the sword, at least for years to" "come, can we only remain in possession however we may dislike to" "view our position in this light." The days, we all admit, have passed away in which by continual strife with one another, independent Princes and Chiefs, were surrounded by hardy and warlike peoples, among whom were to be found, as Sir Henry Sleeman records, many mere youths, who on presenting themselves for enlistment in our Army of by-gone days, were found to have several scars on their bodies, signs of fighting even in their earliest years. These peoples, during the quiet times of later years, may have shewn unmistakable signs of the effeminacy begotten "of a calm world and a long peace," and may be worthless as soldiers, but for all that even if such be the case, we cannot entirely ignore these Armies of independent Princes and Chiefs. Even then, if we do succeed in effecting every possible retrenchment, our Military expenditure may still equal the aggregate annual revenue derived from Salt and Opium, a very serious consideration.

We now proceed to the examination of the principles upon which we are to proceed with the reconstruction of the Native Army, and the abolition of all really useless commands, and redundant Staff appointments, abolishing the Indian Staff Corps, and no longer employing Military men except on purely military duties. We may then be able to roughly approximate the amount we shall save by so doing. But, taking the most sanguine and hopeful view of the case, our European Army must always prove a very heavy charge on Indian revenues, this must be accepted as an incontrovertable fact.

First we abolish the three Presidency System, the appointments of three Commanders-in-Chief, with the following Military Departments and staff appointments. The Judge Advocate General's Departments. The Offices of Military Controllers of Accounts, with their Examiners of Pay, Commissariat, Ordnance, Clothing, Medical, and Stud Accounts. If the amounts, bonâ fide recovered, and saved to the state, by the last named officers and their departments were put on the credit side of the Account, as against the pay and expenses of keeping them up, we should, I opine, obtain a considerable amount saved to the state. This of course I have no means of doing. Pay Departments and Offices. The Ordnance and Commissariat Departments. The Adjutant General's Departments, Quarter Master General's Departments. The Clothing and Stud Departments. The Superintendents of payments to pensioners, and Military Cantonment Magistrates; all Military Officers employed in police, political, civil, and judicial, appointments of every kind, should either be relegated to Military duty, or compelled to adopt the uncove-

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nanted service as their future roll, or pensioned. It is with any thing but pleasant feelings that such sweeping reforms are put forward, but the unbounded extravagance displayed in India, and the incessant multiplication of apointments, ever since 1860, are entirely answerable for the present state of affairs which necessitates retrenchment.

The Army would perhaps be re-organised, on some such plan as follows.

1 Commander-in-Chief for the entire Army, European and Native, Salary £6000 per annum without any seat in the Viceregal Council. The Viceroy to have no more to say to the Army in India, than the Prime Minister at home has to say to the Army in England. The Army must be governed by its own Chief, who should be responsible for it under all circumstances, and if his work was well and thoroughly done, he would have no spare time on his hands during his tenure of Office.

1 Chief of the Staff with 4 Assitants, and an intelligence Department with a Colonel as its Chief.

1 Director General of Artillery and Stores with 3 Assistants; all executives to be civil uncovenanted servants.

1 Director General of transports and commissariat with 4 Assistants. All executives to be civil uncovenanted servants.

1 Director General of Engineers, Barracks, and fortifications with 4 Assistants, all minor executives to be civil uncovenanted servants, except as regards fortifications. Railways, and Telegraphs to be purely civil departments. No other departments are required apparently, as each Corps D'armée, and each Battery and Regiment of each Corps D'armée, should be a perfect unit in itself. The Treasury department of the Civil Government would have the control and check of all payments made on account of the army.

With regard to Military law. The General Officer Commanding a Corps D'armée, should only have the power to assemble General, and District Courts martial, once assembled, the Prisoner should be tried by the Court, and the finding and sentence should be read out by the President to the Prisoner, at the conclusion of the trial, and a final appeal should be permitted to the Viceroy through the Commander-in-Chief in Capital Cases, and long terms of penal servitude only. Our present Military law machine is a fearfully complicated one, and is not altogether perfect as regards the maintenance of true discipline. The same system should be applied to minor Courts martial from the sentences of which there should be no appeal.

Officers would come under the Commander-in-Chief and have an appeal in all serious cases to THE QUEEN through the Commander-in-Chief in India and the Commander-in-Chief at Home, and the

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Secretary of State for War. The Secretary of State for India, should have no voice in Army matters, any more than the Secretary of State for the Colonies. There should be three large Arsenals or Stores Depôts, with minor depôts and Magazines located on suitable sites accessible by land route, and not too far from the Sea Coast, all in charge of the civil department of the Director General of Artillery and Stores.

The Manufacturing Departments in India are very backward, and imperfectly developed, these are very important Departments, as when properly organised, it should not be necessary to obtain a single Article of warlike matériel and stores, soldiers clothing, Regimental necessaries, harness and saddlery from England. Guns and certain classes of projectiles and fuzes alone excepted. This would cause quite a revolution in exchange, as the enormous Indian Bills now paid in London would be extensively reduced in amount. A land transport department does not really exist, nor yet a stud department, at any rate the latter does not exist in Madras or Bombay, there horses are simply bought and kept eating their heads off for nearly 12 months, when they might be sent to Batteries and Regiments of Cavalry direct after being purchased by a Committee of Regimental Officers deputed in each Corps D'armée for that purpose. If it is better that there should be a stud breeding department, by all means let there be one, two, three or more, properly organised and superintended. The Barracks that have latterly been erected for soldiers have been on the same grandly extravagant and extensive scale, as every thing else Military in India. A simple plan of moveable Barracks capable of being taken to peices and put together by the men themselves, are really all that are required almost over the entire peninsula of India. Ground around Barracks soon becomes fouled and unhealthy, moveable Barracks would admit of the ground being ploughed and cultivated, and so purified, and thus again become fit for occupation, this process being repeated as required. No white wash, bricks or mortar, need be used. Once the present palatial Barracks are placed *in situ*, they remain (not always *enduring*) monuments of regretful expenditure thrown away on unhealthy localities in many instances. The hill plateaux too have not, as yet, been sufficiently utilised for the location of European troops.

Such is a brief outline of some of the Military reforms which would result in a very considerable saving. When we come to the consideration of Her Majesty's European troops in India, we will enlarge further upon the subject of economy with efficiency. The dual medical services are already doomed it appears, and their double appointments go with them. Native doctors will now in all likelihood be appointed to Native Regiments, and very good men they are for these appointments, and also for Native gaols. This will certainly result in considerable saving and the preparation of many useless returns, and statistics the bane of the doctor's life, and seldom read except by compositors, proof readers, and printer's devils when put together in type.

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The Native Armies of India were shewn to be as follows, with 3 Commanders-in-Chief, 16 Divisional and 34 Brigade commands.

44	Cavalry Regiments Regular and Irregular ...	15,887
11	Batteries Irregular Artilley	1,406
25	Sapper Companies Regular	2,877
144	N. I. Regiments Regular and Irregular ...	100,090
	Total ...	120,250

Reconstructed Army, 1 Commander-in-Chief £6,000 a year, 6 Lieut. Generals at £3,000 each, 24 other Generals Commanding Brigades at £2,000 each per annum.

50	Regiments Cavalry	20,000
30	Sapper Companies	3,000
150	Regiments	105,000
	Total ...	128,000

The requisite number of A. D. Cs. would be detailed for the Commander-in-Chief, and his subordinate Commanders, both for peace and War.

Each Cavalry Regiment, I Commandant, 1 Second in Command, 4 Captains, 4 Subalterns and Native Officers as required.

Each Sapper Company 1 Captain, 1 Subaltern, Serjeants, Corporals, and 2nd Corporals, with native officers as required. Officers to be taken from the Royal Engineers only.

Each Regiment of Infantry, 1 Commandant 1 Second in Command, 4 Captains, 16 Subalterns, Native Officers as required. Adjutants of Cavalry and Infantry to be subaltern Officers. There would then be 200 Colonels allowances as the prize pensions of the Military Service in India, with £1,000 a year for each. We would require 200 Lt. Colonels to Command Regiments, 200 Majors, 800 Captains, 2400 Subalterns.

Total 400 Field Officers, 3200 Captains and Subalterns. The pay of the senior grades might be reduced, and that of the lower grades increased, the pensions of all being increased. After 20 years service £1 per diem, and gradually increased, up to £900 per annum, exclusive of course of the 200 Colonels on allowances of £1000 a year.

With our present splendid means of intercommunication the location and distribution of the Army in India including the British Burmah Brigade, becomes a very simple question ; bearing in mind that except for health and expediency, not a single European soldier need be stationed south of Hydrabad, (Deccan,) and then the hill plateaux should be utilised, and made easy of access.

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The total field Officers, Captains and Lieutenants on the 3 Presidency System, excluding all Generals, amounts to 2200. Rank and file 120,250 men. The total field Officers, Captains and Lieutenants of the one proposed Native Army, excluding all General Officers, amounts to 3600.

Rank and file 128,000 men.

If this be deemed a sweeping reform, the system proposed has all the merits and essentials laid down by the late Prince Consort, viz *simplicity, unity, steadiness of system, with unity of command.*

While we retain the three Presidency system, with in reality 4 Commanders-in-Chief, the Secretary of State for War, the Secretary of State for India, the Viceroy, and the two minor Governors, all in a measure, controlling, and supervising our cumbrous and worn out Military machine, these important essentials cannot be attained.

On the One Army System for India the pay of the Commander-in-Chief, and the thirty Subordinate Commands cost about £72,000 a year. The three Presidency system, with 3 Commanders-in-Chief, and their Subordinate Commanders, cost about £194,000 annually. This however is but a drop in the ocean, of economy when compared with the amount saved by the other proposed abolitions of departments and redundant Staff Officers.

(*To be continued.*)

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VI.

NOTES ON THE HISTORY OF 'SAPPERS AND MINERS,'

BY MAJOR GENERAL F. R. MAUNSELL, C. B.

Royal Engineers.

The following extracts from 'History of the Royal Sappers and Miners,' also notes of General Orders organising the three Indian 'Corps of Sappers and Miners,' may not be uninteresting to some of our readers.

It will be seen that Pioneer Regiments are no new thing in India. Although neither regularly trained nor composed of artificers, nor under Engineer officers, the idea of having such working corps no doubt satisfied those who, in those days of slow motion and incomplete organisation, were not aware of the utility of better system and regular training, and so militated against the formation of 'Sappers and Miners,' and indeed to this day the proportion of Sappers in India—except in the Madras command—is far below that of any other Army in the world, being less than one half of the average.

The old Pioneer regiments in Bengal and Madras, and some artificer companies in Bengal, were broken up on, or after, the formation of the 'Sappers and Miners.' That they had been most efficient soldiers is testified by the eulogiums passed on them at the time, and the opposition made by some in authority to their being so abolished.

The re-formation of Pioneer regiments, and the useful and distinguished services done by the 23rd and the 32nd P.N.I., testifies that the utility of trained working soldiers is more fully appreciated now-a-days. Whether their formation into separate regiments of the line, or in a proportion to each regiment, is the better formation, need not be here discussed.

ROYAL SAPPERS AND MINERS.

Royal Warrant, 6th March, 1772, directed the formation of 'The Military Company of Artificers,' officers of Engineers to be attached. The Company served with distinction at the siege of Gibraltar. It was afterwards increased to two companies.

Royal Warrant, 10th October, 1787, directed the formation of a 'Corps of Military Artificers,' it was criticised, indeed ridiculed in parliament. The Corps consisted of six companies of 100 men each. It was to take post on parade next to the Royal Artillery.

Royal Warrant, 11th September, 1793, added four companies for foreign service.

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In June, 1797, the two Gibraltar companies were incorporated with the 'Royal Military Artificers.'

The Corps served with distinction in Spain.

The title was changed on 5th March, 1813, to 'Royal Sappers and Miners.'

Royal Warrant of 20th March, 1819, reduced the establishment from twenty-four companies—1,258 men—to twelve companies—752 men.

Three Survey companies were added in 1824-1825; two companies were added in March, 1827.

The corps was again reduced in 1833 from seventeen to twelve companies, and again increased, until on 1st April, 1848, there were twenty companies—2,000 men.

In April, 1856, there were twenty-two General Service companies, four Survey companies and one Driver troop. The Head-Quarters of the Corps was moved from Woolwich to Chatham on 10th January, 1856.

The Corps served in many expeditions and special services from 1813 to 1854-55, when it was highly distinguished in the Russian War. They were the first to use the Field Electric Telegraph in the field in 1854.

Six more companies were added in October, 1856, making thirty-two companies and one driver troop—4,025 men.

In October, 1856, the designation of the corps was changed to that of 'Royal Engineers,' from that of 'Royal Sappers and Miners'—but these changes were only in name; the Corps was identically the same from 1772; the same class of men and duties and the same officers have existed throughout.

There are now forty-three companies, of which fourteen are special; viz., four Field companies, four Survey companies, four Submarine Miners companies, two Telegraph companies, and three are in India, forming the depôt for the Engineer N. C. O.'s employed with the Sappers and on works; there are also two troops.

The following is Conolly's account of this last change.

'On the 17th October, 1856, the second anniversary of opening 'the siege of Sebastopol, the designation of the "Royal Sappers and 'Miners," was altered by Royal authority to that of "Royal Engineers," 'probably as a compliment to the Corps for its approved services before 'Sebastopol.

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'Thus is removed that standing misnomer by which the Sappers 'and their Officers—virtually one body—were by some incomprehensible 'caprice, called by a plurality of titles. Separated by name from their 'officers, the want of family patronymic—one title of identity in common 'was keenly felt by the Sappers.

'Sir C. Pasley was the first to moot the question. His representa- 'tions ran through a period of forty years. Many other officers consider- 'ing that no sacrifice of exclusiveness should stand in the way of improv- 'ing the status of the Corps, adopted his views, and with the generous 'assistance of Sir J. Burgoyne the change was effected—breaking up 'an anomaly which it is proudly hoped will interlink and cohere both 'officers and men.

'Accompanying this change was the abandonment of the designa- 'tion of private for that of sapper.

'The history of the "Royal Sappers and Miners" is now closed, 'henceforward its services belong to the history of the "Royal Engineers."'

Indian Sappers and Miners.

In India no trained Sappers existed before 1819, the Engineer officers had to improvise workmen and apparatus as the occasion arose, their military operations were accordingly much impeded, civil workmen and line or pioneer soldiers were ill able to fill the places of regularly trained Engineer soldiers. The want of such men is well noted in 'Lake's Sieges,' from which the extracts bearing on the subject are given below.

Impressed with the importance of forming 'Corps of Sappers' in India, The Honorable the Court of Directors despatched a detail of European Engineer soldiers in 1818, trained at Chatham with the 'Royal Sappers and Miners,' as notified in Government of India General Orders, of 17th December, 1818.

By Bengal Government General Order of 13th February, 1819, the Governor General in Council notified the resolution to form a battalion of 'Sappers and Miners,' officered from the Corps of Engineers; the above mentioned Engineer soldiers being distributed as N.C.O.'s., and Native soldiers being selected from the Pioneer regiments. The European N.C.O.'s to exercise command next to European commissioned officers, as laid down in Order of 11th January, 1810.

The Court of Directors issued Orders in 1823 for the organisation of a 'Corps of Sappers and Miners' in Madras, but, there not being sufficient Engineer officers available, this Order was not carried out until 1831; when Engineer officers were available and some trained Engineer soldiers had been sent out, General Order, Fort St. George, 24th May 1831, directed the formation of a 'Corps of Sappers and Miners' (under

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Engineer officers), from the 1st Battalion of Pioneers, and laid down the establishment and allowances, placed the Corps under the control of the chief Engineer as to its employment; the discipline and economy being under the Commander-in-Chief.

In 1826, General Order, Bombay, 4th December, 1826, the Honorable the Governor in Council directed that a 'Corps of Sappers and Miners' should be raised and trained by Engineer officers, under instructions from the Chief Engineer. The European N.C.O.'s being obtained from European artillery and infantry, and the Native soldiers from Native infantry regiments.

The present establishment of these corps are, in Natives:—

	Total.		
	Cos.	All ranks.	
Bengal...	10	1160	In Bengal three companies are nominally Telegraph and Pontoon, but practically General Service. In the totals are included 24 Recruit Boys for Madras, and 12 for Bombay.
Madras .	11	1334	
Bombay.	5	492	

Extracts from Lake's Journal of Sieges.

MADRAS, 14TH FEBRUARY, 1822.

'The Directors of the East India Company are not ignorant of the 'advantages that would be derived from having this branch of their 'army on a more efficient footing than it has hitherto been; for of late 'years all their officers of Engineers, before leaving England, have been 'placed under the orders of the officer above alluded to, in order that 'they may be more fully instructed in that part of their duty which 'relates to the attack of places; and recently a few recruits, trained at 'Chatham, have been sent out to Bengal, where a permanent "Corps of 'Sappers and Miners" has been raised, and a large increase made to the 'Engineer Corps. The sister Presidencies have not, as yet, shared in 'these benefits, although the principle has been established, and the 'necessity of improvement (in time of war at least) acknowledged.

'This leads me to the consideration of the second improvement 'before mentioned, namely the necessity of having a well trained Corps 'of Engineer soldiers, or of men properly instructed and exercised before 'hand, in all the operations of a siege, to assist the Engineer officers in 'their arduous duties in the field. Of all the defects, that have hitherto 'led to those lamentable disasters, with which many of our Indian sieges 'have been attended, the want of such a Corps has been the most glaring 'and pernicious; and if that defect be remedied all the minor arrange-'ments and improvements necessary will follow as a matter of course.

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'During the whole of the wars that have hitherto been carried on 'in India, the Engineer officers have never had a man employed under 'them who understood before-hand any one of the duties, which he was 'required to execute.

'Yet absurd as it may appear, such is a correct picture of what 'has hitherto been the actual state of the Engineer Department of the 'Companies' Armies. It has been the hard fate of the Engineer officers 'to waste those precious moments when skill, energy, and activity, were 'most wanted, in the irksome and laborious drudgery of superintending 'a multitude of little details, which in other services would be the duty 'of a private, or, at the utmost, of a corporal of Sappers. What prospect 'of success, therefore, could an Engineer have had in contemplating the 'long protracted labors attending the ulterior operations of a regular 'siege, such as the execution of the sap under close musketry fire with-'out Sappers, and the execution of mines without Miners?

'In the late war the siege of Nowa, conducted by Ensign Oliphant, 'is an example; upon which it may be remarked, that if that enterprising 'and skilful officer had been provided with a body of properly trained 'Sappers and Miners,' the place might undoubtedly have been taken in 'half the time.'

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By order of the Council,

A. D. ANDERSON, CAPT., R.A.,
Secretary, United Service Institution of India.

SIMLA,
10th June 1880.

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The address book is corrected up to date from the Army Lists, but mistakes are occasionally unavoidable, unless members themselves promptly notify their change of residence.

Members proceeding to England on leave, who wish the Journal to be forwarded to them while absent from India, should inform the Secretary, and send stamps for the postage by Brindisi.

When a member appears in orders for leave to England, his Journal is not despatched unless he asks for it, and while absent from India his subscription is not payable unless the Journal is supplied.

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The Secretary will be happy to send an Index to Volumes I, II, III, IV, V, VI, VII, and VIII, to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Secretary, United Service Institution of India.

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ORIGINAL PAPERS.

I.

REGIMENTAL DEPOT COMPANIES, AND RESERVES FOR THE NATIVE ARMY OF INDIA.

BY

C. I. G. FITZGERALD MAJOR.

Second in Command 3rd Cavalry, Hyderabad Contingent.

INFANTRY.

I. I think it is the unanimous opinion of the army at large, that the experiences of the last Afghan Campaign go to prove that Reserves are indispensable for the Native Army of India. Starting on this hypothesis let us consider, with our present organisation, how an efficient Reserve can be formed sufficiently strong for all probable Contingencies?

II. The present peace establishment of a Native Infantry Regiment is (600) bayonets, and and I hope to be able to show how a Regiment can, in a few days, be brought to a war strength of (1000) bayonets, and still have a Reserve of (200) bayonets.

III. In the first place I propose to raise the peace strength of Regiments from (600) to (700) bayonets, and that one Company be disignated "Depôt Company" All Recruits on being enlisted would be posted to this "Depôt Company," and on their being passed into the ranks and sworn in, they would be transferred from this "Depôt Company," to one of the other Companies. This "Depôt Company," would as a rule be composed entirely of Recruits, with of course its complement of Commissioned and Non-Commissioned Officers. As the name signifies, this "Depot Company" would never be sent on service, but would form the Depôt of the Regiment, to enlist, drill, train and equip men to fill up the ranks of the Regiment as vacancies occur.

IV. In the second place I propose to raise a Regimental Reserve of (500) bayonets, at a cost a little over and above that now incurred on our present useless—as far as the state is concerned—body of Pensioners. This is perhaps rather a rash statement to make, as I do

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not intend to prove my statement by figures, not having the means or data at hand that are requisite for the purpose. In order to form a Reserve such as I propose, it is necessary that our present system of enlistment be completely altered, and in such a manner, that it will be entirely and solely the fault of Commanding Officers if any inefficient men are borne on the strength of Regiments. The present Pension List, by this new system of enlistment, would become a thing of the past as far as Pensions to privates are concerned—I do not include wound Pensions.

(*A*) Men to be enlisted for a term of (6) years, after which period it would rest with the Commanding Officers whether, (1) the man be discharged, (2) remain in the Regiment, (3) be transferred to the Reserve.

(1) If the man be discharged he would receive a gratuity according to a scale laid down.

(2) If retained in the Regiment he would as a matter of course be a man of good character, and otherwise a fine soldier. He would then be re-enlisted for a further period of 3 years, and the periods of re-engagement to be renewed as often as the Commanding Officer thought fit, but as a general rule—to which there should be *very* few exceptions no private should be retained in the Regiment after a service of 15 years, or be permitted to join the Reserve.

If there be any exceptions to the above general rule, they should be re-enlisted for further periods of 3 years, but at the discretion of Commanding Officers, or be discharged on Gratuity according to the scale laid down for length of service. Any man having served a period of 24 years, it should be *obligatory* on the Commanding Officer to pension him. This would be the only pension that it would be possible for a *private* to attain.

(3) If transferred to the Reserve, his name would be borne on the Regimental Reserve Roll, and he would be brought on the strength of one of the Reserve Depôts, which (Depôts) should be formed at large military stations conveniently situated.

(*B*) The pay of men in the Reserve to be Rs. 2 per mensem, and Rs. (8) for the month of training. Rs. (6) to be paid to the men on reporting their arrival at Reserve Depôt Head Quarters, and the remaining Rs. 24 (viz $(11 \times 2)+8-6=24$) after their months training, but only to those who have served full (12) months in the Reserve.

(1) The smartest men in the Reserve, in the proportion of 5 per cent. for each rank, to be made Non-Commissioned Officers, and to receive an allowance—but only during the month of training—of Rs. 5 for Havildars, and Rs. 2 8 0 for Naicks. During the remaining (11) months of the year they would receive the same pay as other Reserve men, viz: Rs. 2 per mensem.

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(2) No man to be transfered to the Reserve against his will.

(3) No man to be retained in the Reserve after (44) years of age.

(*C*) Reserve Depôts to be formed at large Military stations conveniently situated, and each Depôt to be Commanded by a permanent Commandant with a Staff Officer, and a sufficient number of men to look after the Arms and accoutrements of the Reserve men. During the month of training Reserve men, whose Regiments are stationed in the District or conveniently near, to join their *own* Regiments, and all others to join their Reserve Depôt Head Quarters. It would be found necessary to tell off a sufficient number of British and Native Officers and Drill Instructors to be temporarity attached to the Reserve Depôts to help the Depôt Commanding Officer to put his men through their months training.

V. Let us now consider how many Recruits will be required yearly for each Regiment, and average ages of the men borne on the strength of the Regiments. The strength of a Regiment according to my proposal being 700 bayonets, about $\frac{1}{6}$th part, say (116) men, would have to be disposed of each year. About $\frac{1}{2}$, (say 58) would enter the Reserve, about $\frac{1}{4}$ (say 29) would take their discharge, and the remaining $\frac{1}{4}$ (say 29) would be retained in the Regiment. By this calculation about (87) Recruits would be required yearly, and this number does not include deaths, and men discharged as inefficient. In round numbers a Regiment would require close on (100) Recruits each year. At a rough calculation, and surmising that the average age of Recruits when enlisted to be 20 years, the ages of the men borne on the strength of a Regiment would be somewhat in the following proportions.

			NUMBER	
Recruits, average age	20 years =	... ...	87	
Second year men, „	22 „ =	... ...	87	
Third „ „	23 „ =	... ...	87	
Fourth „ „	24 „ =	... ...	87	
Fifth „ „	25 „ =	... ...	87	
Sixth „ „	26 „ =	... ...	87	522
Seven to nine year men, average age	27½ „ =	... ...	80	
Nine to twelve year men „	30½ „ =	... ...	55	
Twelve to fifteen year men „	33½ „ =	... ...	30	
Fifteen to twenty four year men „	38 „ =	... ...	13	178
	Total Men.	... ...	700	700

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In a Regiment enlisted under the terms I propose there would be (522) men under (27) years of age, and only (13) men over 35, but under 44 years of age. A Regiment thus composed should, as far as age is concerned, be a very efficient Regiment.

(*A*) While touching on the efficiency of Regiments there is one point that appears to demand consideration. The point I refer to is that the Regimental lines of many Regiments—more particularly of the Southern and Western Armies—have become something little short of what I may describe as rabbit warrens. Many, if not most, of the Sepoys of the above mentioned Regiments appear to be blessed, (or cursed which ever you like to call it!) with any number of old relatives of both sexes,—but old women preponderate,—and a string of children of all ages! In order to feed these hungry mouths on a private's pay that is barely sufficient to feed a man and his wife, the soldier is *obliged* to starve himself, which means to make himself perfectly inefficient as a soldier, for any service, save Cantonment Guards! The proposed system itself cuts at the root of the disease, but perhaps further legislation is necessary.

I suggest (1) that privates under 6 years service be obliged. to live in the Lines "en garcon," or more strictly speaking, that none of their relatives male or female be permitted to live in the Lines. (11) That Non-Commissioned Officers and privates over 6 years service be permitted to have their families (Father, mother, wife and children) in the Lines, but with the consent of Commanding Officers. Men ought to be discouraged bringing their families into the Lines, and if as much leave were granted to the men of the different armies of India, as is granted to the Punjab Frontier Force, I am sure very few men would wish to bring their families into the Regimental Lines.

VI. The next point to be considered is, a Reserve being formed under the proposed system, what would be, the Ages of the men forming this Reserve?

On the supposition that (58) men of 6 years service would join the Reserve every year, and that (29) men would be retained in the Regiment,—half of which number would probably join the Reserve in the next nine years, say at the rate of 5 men every 3 years—there would be about (60) men joining the Reserve every year. That is, (58) men whose ages would average (27) years, and a very small sprinkling of men whose ages would probably be, some 29, some 32, and a few 35 years.

The ages of the men in the Reserve—supposing the Reserve to be at its full complement—would probably stand thus.

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1st	Year of Reserve Service	58	men, average age	27	years.
2nd	„	58	„	28	„
3rd	„	58	„	29	„
4th	„	58	„	30	„
5th	„	58	„	31	„
6th	„	58	„	32	„
7th	„	58	„	33	„
8th	„	58	„	34	„
	Total Men	464			

Out of a total of (500) men there would be (464) men under 35 years of age.

The ninth year—when your Reserve men join the Reserve Depôt from service with the colors—you would naturally get rid of the oldest men borne on the strength of the Reserve, and also those considered (by the Officer Commanding the Depôt Reserve) otherwise unfit for active service.

VII I propose that the rates of pay in the army be slightly altered.

(*A*) Free Kit

(*B*) Pay Rs 7 per mensem for first six years, plus batta for dearness of Provisions.

(*I*) Good Conduct stripe annas (8) per mensem from (3) to (6) years service.

(*C*) Pay Rs 8 per mensem from 6 to 15 years service, plus batta for dearness of Provisions.

(*D*) Pay Rs 9 per mensem from 15 to 24 years service, plus batta for dearness of Provisions.

(1) 1st Good Conduct stripe annas (8) per mensem
2nd „ Rupees (1) per mensem
3rd „ Rupees (2) per mensem

Good conduct stripes to be granted under the same rules as are in force for British Troops, but a man must have served (3) years before entitled to another stripe.

VIII. I recommend most strongly that Commanding Officers be given back their old powers of summarily discharging men. If Commanding Officers had these powers they could and should be held answerable if a single inefficient was borne on the strength of their Regiments.

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IX I propose the following scale of gratuities.

Service with the colors.

Men discharged after	6	years service,	3	months	pay at Rs.	8	per mensem
Do.	9	years „	6	„	„	„	
Do.	12	years „	9	„	„	„	
Do.	15	„ „	14	„	„	„	
Do.	18	„ „	18	„	„	„	
Do.	21	„ „	24	„	„	„	
Do.	24	„ „	A Pension				

Service with the colors and Reserve.

Men discharged from the Reserve to receive whatever gratuity they are entitled to for length of service with the Colors, plus Rs. (4 0 0) for each year's service in the Reserve.

Thus a man discharged after 6. 7. or 8 years service with the Colors, would receive $8 \times 3 = 24$ Rupees. After 9, 10 or 11, years Service with the Colors, would receive $8 \times 6 = 48$ Rupees,

After 6 years service with the Colors, and 8 years with the Reserve, would receive $(8 \times 3) + (8 \times 4) = 56$ Rs. and so on.

X. Let us now consider how the proposed system for forming Regimental Reserves can best be applied, so that we may have a nucleus of a Reserve almost *at once*. It must be borne in mind that the men now in the service are guaranteed certain pensions after so many years service, and on that account it would appear necessary for the first five years to grant increased gratuities to induce men to join the Reserves.

My proposals are

(*A*) All Regiments to be thoroughly weeded, from the senior Native Officer to the junior recruit, those entitled to pension to be pensioned, and all others to be discharged on gratuity according to the rules of the service now in force.

By this means a certain number of Vacancies would be created, and all new enlistments would be made according to the terms of the proposed scheme.

(*B*) Throw the Reserve open to all men under 15 years service (Commanding Officers to be at liberty to reject any offers they thought proper) and should a sufficient number not join the Regimental Reserves, certain inducements, in the shape of gratuities, should be offered. All those joining the Reserve on receiving gratuities, would *not* be entitled to a second gratuity on leaving the Reserve, except for length of service in the Reserve.

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(C) Gratuities to induce men to enter the Reserve.

Men of	6 years	service	3	months	pay	at Rs.	(8)	per mensem
Men of	9 years	„	6	„	„ at	„	(8)	„ „
„ of	12 years	„	12	„	„ at	„	(8)	„ „
„ of	15 years	„	18	„	„ at	„	(8)	„ „

I have no doubt that upwards of (150) men per Regiment would be induced the first year to join the Reserve, and for the next four years (20) to (30) men each year would probably join. Each Regimental Reserve would probably number.

150 men the 1st year.
180 men the 2nd year.
210 „ 3rd „
230 „ 4th „
250 „ 5th „

The 6th year after the formation of the Reserve, close on (200) men would have completed 6 years service, viz the Vacancies caused by the (150) men who joined the Reserve the *1st* year, plus say (50) men who took their discharge or were weeded out. Of these (200) men, probably (100) would join the Reserve, (50) take their discharge, and (50) remain in the Regiment.

The 7th year after the formation of the Reserve, close on (80) men would have completed their 6 years service, viz: the vacancies caused by say (30) men who accepted the gratuity the *2nd* year it was offered plus say (50) men pensioned, discharged &c. Of these (80) men probably (40) would join the Reserve.—Roughly speaking for the 7th 8th 9th and 10th years after the formation of the Reserves, close on (50) men per annum would join. Thus the Reserve would number.

350 men the 6th year.
400 „ 7th „
450 „ 8th „
500 „ 9th „

In (9) years time after the establishment of the proposed system, each Regimental Reserve would probably mumber (500) bayonets.

XI. By the proposed system the pension rules for the Native Army would have to be reframed. For privates there would be only one scale of Pension viz after (24) years service, but if the principles of the proposed system are carried out in their entirety, *few*, I may safely say *very few*, would ever reach this pension. It should be made *obligatory* on Commanding Officers to pension all Commissioned and Non-Commissioned Officers after (24) years service, and any special exceptions to the rule should be reported for the consideration of the Commander-in-Chief.

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(*A*) I take this opportunity of remarking that I consider that Non-Commissioned Officers should not be promoted to the Commissioned ranks, except under *very* exceptional circumstances, such as gallantry in the Field. Government should use every endeavour to induce the sons of Native Noblemen and gentlemen to enter the service as Commissioned Officers. Military Colleges should be established at large military Contonments for the education and training of those Native gentlemen, candidates for Commissions.

XII. Having thus far laid down a rough sketch of the general principles involved in the system I propose, let us for the sake of argument imagine that a Regiment is formed as proposed of (700) bayonets, with one Company called a "Depôt Company," We must also imagine that this said Regiment has a Regimental Reserve of (500) bayonets. War is declared, the Reserve are ordered to be embodied and the Regiment is ordered on active service, let us suppose to Egypt or Asia-Minor. Of the (700) bayonets serving with the colors, upwards of (600) (probably 622) would be efficient bayonets ready for active service, and the remaining (78) or in other words the "Depôt company," would be composed of the Instruction staff and Recruits.

On the embodiment of the Regimental Reserve, (400) Reserve men would *at once* join the colors, and proceed on actice service, thereby bringing up the strength of the Battalion to (1000) bayonets, and the remaining (100) Reserve men would join their "Depôt Company." By this system we would have a Regiment of (1000) efficient bayonets in the Field, and, a Reserve of (100) Reserve men, ready at a day's notice to fill up any casualties caused by service, plus the "Depôt Company" numbering close on (100) Recruits. It would be necessary to leave one British Officer with the "Depôt Company" who should be given the full powers of a Commanding Officer as regards enlistment &c. This Officer should be able to turn out sufficient Recruits to keep his Regiment up to its full complement of (1000) bayonets.

At this present moment many, if not most, of our Regiments on service in Afghanistan can scarcely muster 400 men, and as far as I know not a single Regiment has a man in Reserve.

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Part II., Cavalry.

Let us now consider how far the proposed scheme will hold good for the formation of Depôt *Troops* and Reserves for the Native *Cavalry* of India? I think it will be found that the principles embraced in the proposed scheme for Depôt Companies and Reserve for Infantry, will hold good,—with a few modifications—for Depôt *Troops* and Reserves for *Cavalry*? As in this I shall be obliged to reiterate a great deal that has already been written in the former part I trust I shall not be considered guilty of tautology?

II. I propose to raise the strength of Cavalry Regiments by

1 Kote Duffadar
6 Duffadars
1 Trumpeter
64 Troopers (including 1 Farrier) and 72 Horses or in other words to form a 7th Troop (minus the Commissioned Officers which I will call the "Depôt Troop." This "Depôt Troop" would in case of War act as the Depôt of the Regiment, and would in all respects be similar to the "Depôt Company" advocated for Infantry Regiments, Vide Para III. of part I. letter. The system advocated for "Depôt Companies" would hold good for "Depôt Troops" in all Regiments Composed of "Khudaspahs," but where any "Bargheers" are borne on the strength of Regiments, some slight modifications would have to be made.

III. I propose in the second place to entirely alter the present system of enlistment, do away with the Pension List, except for Commissioned and Non-Commissioned Officers, and exceptional cases of Troopers of (24) years services, (Vide Para IV. part I.)—and raise a Regimental Reserve of 200 "Lances" I purposely use the word "lances" as I am of opinion that all Native Cavalry should be armed with the lance, a weapon in which Natives have the greatest reliance, and hold in high estimation.

(*a*) Men to be enlisted for a term of (9) years, but in all other respects, except where otherwise noted—all enlistments, and transfers to the Reserve, to be made under the same terms as advocated for Infantry.—I consider (9) years the shortest term of enlistment that should be established for *Cavalry*, as it takes a long time to train a Cavalry soldier, and the amount of horseflesh that is expended on training cavalry Recruits is very great, and tells heavily on Regimental Horse Chunda Funds.

(1) Para 2691 Bengal Artillery Regulations entitling Non-Commissioned Officers and soldiers to take their discharge after (3) years service, should be cancelled. No man under *any* circumstances should

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be allowed to take his discharge under (3) years service, but any man, over (3) and under (9) years service, wishing to take his discharge, should be obliged to pay Rs (5 0 0) into the Regimental Horse Chunda Fund, but even then it should be optional with Commanding Officers to accept the resignation or not as they thought fit. Men would then think twice before they claimed their discharge.

(*B*) The pay of men in the Reserve to be Rs (2) per mensem and Rs (10) for the month of training.

(1) The smartest men in the Reserve—in the proportion of 5 per cent. of each rank—to be made Non-Commissioned Officers, and to receive an allowance of Rs (5) for Duffadars, and Rs. (2 8 0) for Lance Duffadars. One Kote Duffadar for each (100) men should be appointed, on an allowance of Rs (9) for the month of training.

(2) No man to be transfered to the Reserve against his will.

(3) No man to be retained in the Reserve after (44) years of age.

(*C*) Reserve Depôts for Cavalry should be formed at large Military Stations conveniently situated, where the arms and accoutrements of Reserve men should be lodged.—For the month of training, the Reserves would have to join their own Regiments, and I have no doubt Regimental Arrangements could easily be made to put the Reserve men through their month's training. The Reserve of all Cavalry Regiments stationed at Segowlee, Nowgong, Morar &c, and stations far distant from Reserve depôt centres, would have to join their Reserve Depôts, and Government would have to arrange for their *mounted* training. In the case of the Reserve being embodied, Government would have to mount them, and provide saddlery.

IV. The next point to be considered is the number af Recruits that would be required yearly for each Regiment, and the probable ages of the men borne on the strength of Cavalry Regiments ?

The strength of a Cavalry Regiment according to my proposal would be—

	7	Kote Duffadars
	54	Duffadars
	448	Troopers
Total	509	Rank and File

About $\frac{1}{9}$th part, say (57) men, would have to be disposed of each year. According to the former calculation (Para V. Part I.)

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about ½ (say 29 men) would enter the Reserve, about ¼ (says 14) would take their discharge, and the remaining ¼ (say 14) would be retained in the Regiment. On this assumption, about (43) Recruits would be required each year, and this number would not include deaths &c. As it is a matter of great importance to enlist young men in Cavalry Regiments, so that they may be shaken into a seat before they are fully formed and developed, I assume (18) years to be the average age of *Cavalry* Recruits, and on this assumption let us consider what would probably be the ages of the men borne on the strength of Regiments?

		Number	
Recruits, average age	18 years	45	(2 Vacancies allowed for deaths.)
Second year men, „	20 „	45	
Third „ „	21 „	45	
Fourth „ „	22 „	45	
Fifth „ „	23 „	45	
Sixth „ „	24 „	45	
Seventh „ „	25 „	45	
Eighth „ „	26 „	45	
Ninth „ „	27 „	45	
	Total	405	Men

			Number
Nine to twelve year men average age	28½	years	44
Twelve to fifteen „ „	31½	„	38
Fifteen to twenty-four years „	39	„	10
			92
	Total		497 Men

By this calculation there is a small discrepancy of (12) men but as the above figures are intended to be only approximately true, I think it is sufficiently correct for all practical purposes? On comparing the ages of men of the two branches of the service we find that in the Cavalry there are (90) men under (20) years of age, but otherwise the ages of the men in the Cavalry and Infantry are much in the same proportions.

V. The next point that appears to demand our consideration is the ages of the men forming our Reserves? Let us work out the problem by the same rules as laid down in para VI. Part I. Assuming that (29) men of (9) years service would join the Reserve each year, and that (14) men would be retained in the Regiment, half of which number would probably join the Reserve in the next 6 years, there would be, in round numbers, about (32) men who would join the Reserve each year.

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The ages of the Reserve men would probably be

1st year of Reserve service,	32	men, average age	28	years
2nd "	32	" "	29	"
3rd "	32	" "	30	"
4th "	32	" "	31	"
5th "	32	" "	32	"
6th "	32	" "	33	"

Total 192 men.

My proposal is to have a Reserve of (200) lances, and the above calculation appears to be quite sufficiently correct for all practical purposes? On comparing the ages of Cavalry and Infantry Reserves, it will be observed that the Cavalry are the younger.

VI. I propose that the rates of pay for the Cavalry be slightly altered.

(*a*) Free Kit for Troopers (horse accoutrements not included).

(*b*) Pay Rs. (30) per mensem for man and horse, (viz Rs. 10 for man, and Rs. 20 for horse) plus batta for dearness of provisions, and plus compensation for dearness of Grain.

(*c*) 1st Good conduct stripe Rs. 1 per mensem
2nd " Rs. 2 "
3rd " Rs. 3 "

(*d*) Allowance for Lance Duffadars Rs. 4 per mensem.

VII. I reiterate, what I wrote regarding Infantry, that I am strongly of opinion that Commanding Officers should be given back the power of summarily discharging troopers.

VIII. The scale of gratuities for Cavalry to be exactly the same as for Infantry, except that the pay of a cavalry soldier to be calculated at Rs. 10 per mensem when with the Colors, and Rs. 5 for each year's service with the Reserve.

IX It is now to be considered how a nucleus of a Reserve can be formed in the shortest space of time? To attain this object my suggestions are almost the same as those I made for the formation of Infantry Reserves.

(*a*) All Regiments to be thoroughly weeded.

(*b*) Throw the Reserve open to all men over 6 years and under 15 years service, Commanding Officers to be at liberty to reject any offer they thought proper. The same gratuities as in the Infantry to

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be offered to men to induce them to join the Reserve, but the rate of pay to be calculated at Rs. 10 per mensem.

Assuming that (80) men per Regiment would be induced the first year to accept the above scale of gratuities and that during the next eight years about (15) men per annum would join the Reserves the Regimental Reserves would increase at the following ration.

80	Lances	the 1st year.
95	„	the 2nd „
110	„	the 3rd „
125	„	the 4th „
140	„	the 5th „
155	„	the 6th „
170	„	the 7th „
185	„	the 8th „
200	„	the 9th „

As in the Infantry, so in the Cavalry, in the 9th year the full compliment of the Regimental Reserve would be attained, viz 200 Lances.

X. With regard to the different terms of service with the Colors, and Pensions for length of service, the same rules should hold good with Cavalry as with Infantry.

If with Infantry it is not considered expedient that Non-Commissioned Officers should be promoted to the Commissioned grades, surely it is doubly desirable in the Cavalry that there should be no rankers holding Commissions? A large number of young men of the purest and bluest blood of the East, are I understand candidates for Commissions in the Cavalry, and it appears to me highly desirable that young men of rank, high social position, and money should join the mounted branch of the service. These young gentlemen should receive their military training in military Colleges founded for the purpose. Although foreign to the subject of this letter I feel I must digress and give it as my opinion—an opinion I have arrived at after years of mature consideration, that that the time has *now* arrived when Government could with safety allow some Native Officers–a certain select *few*–to rise to the higher ranks of the military service, and in such a manner that the interests of British and Native Officers need never clash. The great Sir Henry Lawrence—perhaps the greatest authority on such a subject as this–in a letter to Lord Stanly dated 1854 writes "France has its "Arab Generals, and Russia has many Asiatic Generals, but liberal "England restricts its best Native Officers to posts subordinate to "that of Sergeant Major, obtainable too only by some thirty to fifty "years servitude." And again the same authority writes, at some period between the Afghan and Sikh wars, "that the Native Officers should "be really Officers in emolument, authority, Pension &c., on a lower "rate of pay suited to their habits and expenses, but still as gentlemen."

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XI. A rough sketch of the principles involved in the system we advocate of raising cavalry Reserves having been laid down let us consider how in practice the system would work? Let us suppose that a Cavalry Regiment up to its full strength, is ordered on service, there would then be

13 Native Officers
6 Kote Duffadars
48 Duffadars
6 Trumpeters
384 Troopers
And 457 Horses ready to proceed on service at a day's notice

and the Depôt troop of

1 Kote Duffadar } Instruction Staff
6 Duffadars }
64 Troopers
And 71 Horses

would be left behind to form the Depôt of the Regiment. On the order for the Reserves to be embodied, the (200) lancers of the Regimental Reserve would at once receive orders to join their Regiments, and no doubt the Officer in Charge of the Depôt Troop would be instructed to mount his Reserve men, and indent on the nearest Arsenal for saddlery. As Regimental Horse Chunda Funds could not in the nature of things afford to mount their Reserve men, and provide them with saddlery, Government would have to stand the expense. If it was considered desirable to send the Regiment on service as strong *as possible*, and as we have calculated that every Regiment would have on an average (32) Recruits, only the Recruits *need* be left with the Depôt Troop, which would give us an extra (32) lances to proceed on Service, thereby bringing up our Total to (416) Troopers for Active service. Some Critics may say "it would take you several months to mount your" "Reserve men, and that during these months your men would be idle and" "comparatively speaking useless." I answer "No." In the first place the (200) Reserve men would be liable for Cantonment duty, and secondly they would barely have had time to have been put through a course of Musketry and drill before the remounts were schooled.

As I pen these lines I see by the public papers that a certain gallant Cavalry Regiment on service in Afghanistan is about to be ordered to the rear, as it is very short of men and horses, caused by casualties created on service. If this gallant Regiment had had a Depôt Troop, and a Regimental Reserve such as is advocated, I argue that it should now be able muster on parade as strong as it did the day it marched out of Cantonments.

XII. The system we are advocating is nothing more or less than a short service system adapted, as we consider, to the Native army, and and the requirements of the East. Some may say that "under short"

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"service the actual necessities of every day are sacrificed to the possible" "necessities of an unforseen and exceptional future" I answer in the words of the Times. "For all practical purposes therefore, the short" "service system may be regarded as the solution of a most difficult" "problem—the maintenance in times of peace and upon a peace" "expenditure of an Army that can at once be expanded to meet the" "necessities of War." Some other crities are sure to say "with the" "present system of recruiting it is difficult enough to obtain recruits of" "the proper stamp and in sufficient numbers, but if you do away with" "Pensions you won't get any Recruits at all." This was the outcry when the short service system was adopted for the British service. The recruiting returns of the British service unanswerably show the popularity of the Short Service System among the recruits, and also the unpopularity of the Long Service System; as two years ago Lord Cranbrook found it quite impossible to obtain any Recruits for even the very small number of long service enlistments that were reserved. I firmly believe that the Short Service System in the Indian service will be found,—after a short time,—to be very popular, and that Recruits will flock in thousands for enlistment.

It is with no little diffidence that I ventilate my opinions on the subject of "Depôt Companies and Reserves," and if this hurried sketch calls forth discussion, I have not written in vain.

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II.

AN HISTORICAL PARALLEL—THE AFGHANS AND THE MAINOTES.

By Lieut R. C. Temple B. S. C., F. R. G. S., M. R. A. S., M. A. I., &c., &c.

I have in my possession a book, extracts from which I propose to lay before the Members of the Institute, as at this juncture being likely to prove of special interest if not instructive. The book in question is called "Reminiscences of Athens, and the Morea, being extracts from a journal of travels in Greece in 1839" by the late Earl of Carnarvon, and is edited by his son the present Earl.* A great portion of the work is devoted to the traveller's experiences in, and a description of the Maina, the wild mountainons district of Southern Greece, and its wild inhabitants the Mainotes, and affords one of the most remarkable parallels it has ever been my fortune to come across in history. For the description of the Country and People might have been written on Afghanistan, so like is it in its general features to what is known of the Afghans and their country, showing how different varieties of the human race will develope similar peculiarities under similar circumstances, in widely separated regions. The very words, almost, in which Lord Carnarvon describes the Mainote character and customs in 1839, were, as I shall show herein, used by other writers, of the Afghans in the very same year. Indeed additional interest is lent to the Narrative by the fact that it was written during the first Afghan war.

The origin of the publication of Lord Carnarvon's little book will be seen from the following extract from the commencement of his preface. "In looking over some family papers, I lately had occasion "to refer to some journals kept by my father during a journey in "Greece and Turkey in 1839; and apart from all personal considera- "tions I was attracted to them by the unusual political interest of the "period. In Greece, as every one knows, the war of Independence had "long since come to an end, the Regency had closed its troubled and "inglorious career, and the Greek Kingdom had been fairly launched "amidst the aspirations of political enthusiasts and with the more "substantial support of foreign loans.

"In Turkey, still reeling from the effects of the long struggle and "irreparable losses of Navarino, crushed in power abroad and revolu- "tionised by new ideas at home, the long expected crisis of the Eastern "Question seemed to be at hand. On the one side the almost unchecked "ascendency of Russia, on the other the unlimited pretentions of Egypt, "threatened the very existence of the Empire; Mehemet Ali was

* London. John Murray, Albermarle Street, 1869.

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" accumulating his Naval and Military resources for a final blow, and " Mahomed, the last of the old Sultans, the destroyer of the Janizaries was " sinking into his grave ; the support of France was uncertain, the " ability of England to interpose with effect, but for the vigour and " courage of Lord Palmerston almost equally doubtful."

At the time when the author of the M. S. notes above mentioned was travelling in Greece, King Otho, the Bavarian, then still young, was at the commencement of his reign of blunders, and the effect of the western European civilization his court introduced had hardly been felt in the Maina, the wildest and most untameable portion of his dominions, so that the state of things about to be described had barely ceased to exist. I can scarcely do better then give the description of the Maina and its people in 1839 in Lord Carnarvon's own words and how apt the description would be in its general outline if applied to Afghanistan and the Afghans, I leave my readers who have been there to judge.

" It may in the first place, be observed, that geographically, the " Maina comprehends one Southern and two Northern divisions, between " which the gifts of Nature have been partitioned with a some what un- " equal hand. The Northern districts* have enjoyed a considerable " share of fertility, trade, and comparative civilization ; but the southern " province, which, forming the extreme Southern portion of the Morea, " is traversed from one end to the other by the mountain range of " Taygetus and terminates in the bold promontory of Matapan, claims " an almost exclusive monopoly of that charm, which the romance of a " rugged country, a doubtful history, and an ominous name† can give. " It has been often a matter of controversy whether the race that inhabit " these wild mountains are, as they themselves tenaciously maintain, the " descendants of the Ancient Spartans. I am afraid that the claim is " at least a very doubtful one. Mr. Finlay, assigns their origin, not to " the Spartans, but either to the Perioeci, whatever the Perioeci really " were, or to the slaves of the Spartans those helots, who after the extinc- " tion of Sparta, became freemen, and usurped with the patrimony the " name of their early masters. Again, how far the boast uttered by " them, and repeated by more than one European traveller, of an in- " dependence of all foreign control or dominion, is strictly consistent with " fact, is a question open to dispute. It is indeed certain, that the " Macedonians, Romans, Byzantine emperors, Franks, Venetians, and " Turks, in turn received the allegiance of the Mainote mountaineers ; " but how far this was more then a merely nominal allegiance may well " be argued. During the successive storms of Mediæval invasion which " broke over the Morea and desolated her fields, this hardy race, retreat- " ing to their fortresses, maintained in every age and circumstance the " rights and liberties of a self-governed people. The population was

* Finlay. Hist. of Greece under Ottoman and Venetian dominion, p. 134

† Kaka-vulia, or Kaka-boulia,—the land of evil Counsel,—Leak's Morea I. 260.

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" poor, the soil was sterile, the plains were few, the mountains were " many and difficult. The Turks destroyed their towns on the sea " coast, but the destruction only quickened their piratical instincts; a " Pasha of unusual vigour might, perhaps, penetrate into their mountainous " district, but he never obtained any real footing: and whilst Austria " trembled in her capital, and the westernmost lands of Europe viewed " with apprehension the advancing power of the Sultan, a nominal " tribute of £1,000 was obtained from the hardy mountaineers who were " living within easy reach of the Porte. And so, if they were not actually " independent of any of the races who successively ruled Greece the " Mainotes, Mr. Finlay observes, made themselves at least of sufficient " importance to obtain from all these races, favourable terms and rights " of self government; if their strange mixture of feudalism and anarchy, " deserves the name of government. They accepted at the hands of the " Porte one of their own Native chiefs, who ruled much after the fashion " of some of the early princes of feudal Europe, not with the restricted " powers of a balanced Constitution, but as the leading noble of a War- " like Aristocracy. The state of society, was in effect eminently feudal " in all its bearings. The chiefs of the country lived in their castles, " surrounded by their vassals and partisans, claiming and exercising the " right of waging private war against each other. And yet rude as " this state was, it evoked some fine qualities. The habits of ceaseless " warfare maintained their courage and simplicity of life, whilst feuda- " lism, largely aided by the natural subdivisions of the country, " confirmed, if it did not inspire a spirit of individuality, and indepen- " dence. Thus the Maina seemed alone to be exempted from the opera- " tion of the general laws, which were gradually reducing the other " countries of the West to uniformity. Time, the worker of all great " changes, there stood still. In other parts of Europe the habits of the " feudal age one by one disappeared; but to the close of the Greek War " the Maina remained unaltered by the lapse of centuries and the " movement of modern thought.

" It is not unusual for a speaker to observe with reference to par- " ticular states or times, that there is neither law nor government when " he only means to intimate that the administration of the day is power- " less, and that justice is overborne by the accidents of the particular " time, or that its provisions at least, are dealt out with uncertainty. " But the Maina, down to the close of the Greek revolution, presented " the remarkable spectacle of a country where law, as law, was unknown. " The right of the strongest, tempered by the observance of certain " chivalrous customs, growing out of their warlike habits, and res- " pected for the sake of general convenience, was the only acknowledged " law in the Maina. The great rule, ' Thou shalt not kill,' issued to man " in the origin of his race, and confirmed by the legislation of every " time and country had scarcely here an existence. It is perhaps " hardly in excess of fact to say that murder was the organised and " formulated expression of the national life. But although the murderer " had no cause of apprehension from the arm of the law he enjoyed

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" a very qualified impunity. The vengeance of the injured family was " not only wreaked upon him, but was extended through a long course " of years to every kinsman of the hated race down to the last link, in " the long chain of successive generations.

" The only occupation considered worthy of a man, was that of " taking his brother's life, and such was the general distrust engendered " by this strange state of society, that men were only safe when shut " up, sometimes for many years together within fortified towers, of " which one of their principal towns was but an agglomeration.

" Yet in this condition of affairs, when every man's hand was against " his neighbour, and when society must have been utterly paralysed " for every good and useful purpose of public and even private life, there " was, strange to say, in the Mainote microcosm an element of strength " which enabled them to combine against foreign aggression, to maintain " the limits of their barren, but beloved country, and to secure fair " terms from their Mahomedan master even in the height of his power. " Uniting qualities at first sight perhaps opposed, they joined an un- " bounded patriotism to an utter contempt for that security of person " and property in which more civilised countries find at once their " greatest strength and their greatest weakness, and were ready to " pour forth their blood like water, to preserve their national indivi- " duality. When a regular government was first established in Greece " at the close of the great struggle against the Turks, the Maina was " not exempted from the operations of general laws, but their promul- " gation was little heeded by those hardy mountaineers, and when the " central authority attempted to enforce them, it was met by a spirit " of resistance before which the dogged and unelastic temper of the " Bavarians quailed. The Regency, naturally solicitous to terminate " a system of domestic hostilities utterly incompatible with the require- " ments of a settled government, but too stupid to effect their object " by the only means which offered a prospect of success, incensed the " pride of the chiefs by requiring them not only to abstain from those " predatory wars in which they had indulged for centuries, but to " throw down their battlements as a mark of subjection to the crown, " and as a guarantee for the future preservation of peace; to this " insulting proposal the chiefs gave the only reply which could be " anticipated from a people who had never yet tolerated any interference " with their internal regulations.

" Animated by one simultaneous feeling, the Mainotes sprang to " arms. To enforce compliance a large force was sent into the Maina " by the Government. It soon met with a severe reverse, and was " obliged to capitulate under circumstances of some discredit, the " majority of the soldiers owing their lives only to the contempt of their " enemies, who sold them, naked and shivering in the public market " at the low price of twopence a head. From this degrading position " they, or many of them, were released by some friends of the Govern-

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" ment, who bought them back at the cost of an additional penny apiece " to the great dishonour of the recently established Court, and amidst " the jeers of a people who despised them too heartily to be much " incensed. Yet those Bavarian soldiers, so sacrificed, were brave men, " placed in a ridiculous position by an incapable minister, Since that " catastrophe the government led to adopt a more prudent policy by their " fears rather than their judgment abandoned all intention of subjugat- " ing the Maina by force, and whilst they endeavoured to conciliate " the chiefs by appointing them to official posts, or undermined their " influence by removing them from the natural sphere of their authority, " they proclaimed to the people an absolute immunity from the taxation " which was prescribed for other parts of Greece but which they did not " dare to impose in the Maina. By such means the government no " doubt, gradually paved the way for the extinction of the civil feuds " of the Maina and the establishment of their authority in that remote " part of the Kingdom. Still, calm and tempest succeeded each other " in frequent alternation, and every now and then there arrived at " Athens the unwelcome intelligence that in consequence of some " collision with the King's officers on the frontier, the Mainotes had " burst from their mountains and were plundering the towns of the " plain below. I believe there was not a name in Greece so hateful to " official ears as that of Maina; there was not a recollection so distaste- " ful to official pride as that of the memorable sale of the King's troops. " It was not unnatural that it should be so; for the Mainote system was " not only at variance with the first principles of settled Government, " but, with the exception of the Corsican vendetta, which though less in " degree, was analogous in kind, and was suppressed by the French " Government only within very recent times, it was one of the most " extraordinary that ever existed in any age or country. A Mainote noble, " if he did not inherit, would build himself a tower, sometimes, it might " be, with the money which he amassed by hard toil beyond the " limits of his country. When once the tower was built his relatives " flocked to him, and erected their dwellings under the shelter of his " Castle. These were his kindred, and bore his name. But others also " trooped in, unconnected with him by family ties, and these became " his vassals and gave him their allegiance in return for his protection. " Thus the whole clan was consolidated and bound as one family to " support the lord in all his feuds, without regard to the justice or in- " justice of the quarrel; and an insult or wrong offered to any member " of that clan, entailed on the wrong doer, a common feud. Jealousy, " a quarrel upon some delicate point of honour, a supposed slight offered " to a woman, the carrying off of a betrothed, were frequent and deadly " causes of animosity. In one instance, some malicious women anxious " to promote strife, under the cover of night seem to have knocked at " the doors of certain houses calling each other by names of young men, " so as to give the notion of an improper familiarity with the daughters " of the house, and kindled a long enduring feud. But when once the " feud was declared, the mode of its prosecution was as ruthless as it " was characteristic of this strange people. The hostile families rarely

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" engaged in open combat. It was a long trial of patience and " skill to determine which of the two parties should exterminate the " other. Going forth singly, or in pairs, they hid themselves among " bushes or behind walls, and patient of hunger, thirst, and weather " they lay in wait for days together to shoot any member of the rival " clan who might pass by. Their towers some of which were of great " strength were guarded night and day by two men, who paced the " battlements, both to prevent a surprise, and destory any enemy who " might walk within musket shot. Women and girls, indeed, they " were content to spare, but boys of more than eight years old were " doomed, as at that age they were considered capable of bearing arms.

" To such an extent did this prevail, that men, when deeply involved " in these family feuds, retired to the shelter of their Castles, and for " years never ventured forth, except when perhaps at night and by " stealth they went out to murder an enemy or undermine his tower.* " Men have been born and married, have lived for twenty or thirty years, " and in some cases have even spent their whole lives within the enclosure " of those gloomy walls.

" One man was born in his tower, and lived to the age of seventy " without daring to quit it. When a man was questioned at Cape " Matapan on some point of local interest, which could not have escaped " the notice of any one of common observation, he replied how should he " know anything of the Country, when almost all his life he had been " shut up in a tower. A fine young Mainote, of good family regretted " that he was unfit for anything but fighting. " I am" he said " twenty- " seven, and for more then twenty years of my life I was shut up in a " tower; never leaving it but a very few times in the dead of the night, " for the purpose of stealing along the ground and shooting an enemy." He " had been speaking of the success of some friends or acquaintances in " certain agricultural and commercial undertakings out of the Maina " where he had become painfully sensible of his own deficiencies.

" During the continuance of these feuds, which with the intervals " of an occasional truce, often endured for generations, the women were " allowed to go free and unmolested, to carry on their avocations, to " cultivate the ground, though at times the hostile party would come down " upon the fields and carry off the harvest, and even to convey food to " their husbands, who were shut up in their towers. Nor was the part " which they took in these merciless quarrels always of this neutral " character. They would sometimes walk in front, and their husbands " would skulk behind them until the men, unseen themselves, came " within gun shot of their enemy, and levelled their deally aim.

" And yet this detestable system of war was not only accompanied " by extraordinary patience and courage, worthy of a better cause, but it

* A singular, and at first sight most unlikely, mode of attack was sometimes adopted, by scooping away the mortar, removing the large stones of the external walls, and so effecting an entrance. Towers have been captured by this form of assault.

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"was redeemed by some great though rude virtues. The Mainotes "never attacked a woman. In the fiercest wars, no shot from tower or "ambuscade seems to have been directed against her. Even when she "served as a screen to her husband, the assailed party is said never to "have returned the fire upon her. Nor less sacred was the virtue of "hospitality. Poor themselves, and barely deriving a subsistence from "their rugged soil, they would accept any privation or make any sacrifice "for the humblest stranger who might claim their assistance. Any "stranger who places himself upon a bench in the church, which is "understood to indicate that he is friendless is immediately received by "some chief and tended with every care during his stay in the country; "and any one who should dare to inflict wrong or insult upon him en- "joying such protection, would call down upon himself the full vengeance "of the clan. There is a story of a stranger travelling in the Maina, and "lodging at the house of a poor Mainote who, having nothing to give "him, with all the unselfishness of the poor man in the scriptural "parable, and the chivalry of the lover in Boccacio's inimitable story of "the falcon, sacrificed for his guest's supper his mule—the one thing on "which he depended for his own daily sustenance and support. It is "impossible to conceive the higher exercise of a virtue, which has "now little more than a conventional existence in many civilized "countries.

"But if their virtues were great, their vices were equally great. "Human life is with them of no account, and the murder of an enemy "slain in what we consider the foulest manner, occasions not a moment's "remorse. Yet they are scrupulous according to their notions of right "and wrong. A breach of hospitality is a deadly sin; a violation of "chastity is a lasting dishonour and an offence for which no punishment "is too great; for truth, they have frequently a severe respect, and on "points of religious performances they are extremely punctilious. "Observing a man eating a fowl in one of their rude dwellings on a "Friday. 'I would not do that for all the world could give me said a "a young Mainote chief,' whose hands were red with a hundred "murders. 'But,' observed the other, 'you would think nothing of "killing a man,' 'Oh no, replied the Mainote', but eating meat on a Friday "is a crime. The legends of that wild country were coloured by the "usages of this ruthless warfare. Thus, there are fantastic tales in "which the ghost appears to the murderer, not as in our colder latitudes "to upbraid, reproach, and drive to madness by means of an accusing "conscience, but to stimulate to fresh acts of vengeance, "Why should "we care for the ghosts of an enemy?" Said on one occasion, a Mainote "soldier, and in this expression spoke the true spirit of the Maina. "Even religion was sometimes made to lend its countenance to these "merciless acts; and the popular superstitions more powerful than "religion itself, came in to consecrate the practice of their daily warfare. "If in the voice of any friend, a moaning or melancholy sound were "detected, it was held to be the sign of his approaching death. Yet "not always necessarily so. The omen might be averted if three women

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" were to work for him a scarf or shirt with the sign of the Holy Cross " upon it; but the workers must all be Virgins of the name of Mary, " the work must be completed in a single day, and that day, one on " which mass was said by a priest. Again, these superstitions admitted " of fine distinctions. If, in the prosecution of his stealthy warfare a " man heard a moaning sound in front of him, it augured success, but " if the sound came from behind, it was of evil presage, and he who " heard it should instantly return. So, too, if two men went out to- " gether upon a common expedition, and one of them could not hear " the tread of his enemy, whilst the other heard it he was from that " moment a lost man. One night a Mainote, lying in ambush, heard " overhead a heavenly sound of cymbals. He accepted the sound as a " favourable omen; immediately his enemy passed, and he laid him low. " The shoes that men wore on these midnight expeditions were made " of pig skin, to enable their wearers to tread lightly; for a practised " ear could distinguish the step of an enemy sometimes half a mile off. " A man who was not at feud stepped boldly, but one who was at enmity " with his neighbour, had a light and comparatively uncertain tread. " The Bavarian officers' said a Mainote 'complained of our tread when " we were at first drilled it was so light and little assured'; but it was " the tread which necessity had taught us, and it was not easy to " unlearn!

" Colonel Leake has described the part which priests occasionally " took at the head of their flocks in the destruction of some neighbour- " ing tower or village, and he hints at the material, though rude, in- " ducements which they may have had to lend their sanction to these " acts of civil war. But that connivance must have been very infre- " quent; as may be inferred from the fact that when asked whether the " priests had no influence in preventing these feuds a Mainote observed " that they would have been in danger had they interfered, but that " they pursued a prudent course in saying that they had nothing to do " with points of honour."

Any one who has been in Afghanistan and seen anything of its people will acknowledge the correctness of the following as a description of the Afghans though written in Greece of the Mainotes.

" The external and the most characteristic illustration of the life " just described was probably to be found in the feudal towers which it " was the object of every Mainote chief to inherit or to acquire, and " which at certain periods of Turkish rule it was equally the object of " every Turkish governor to destroy. There was indeed a time when " the larger and more important of these Castles, commanding some " head land or cave in the sea-worn line of those rocky coasts, enabled " their owners to combine the excitement of civil feuds by land with " the more profitable occupation of piracy by sea. It was in part a " return to the sea-faring life of their classical ancestors, in part a " repayment to others of the sufferings they themselves had undergone.

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" Plundered and ravaged in still earlier times by almost every " nation of Europe, by Venetians as heretics, by Mahomedans as Chris- " tians, and by Spaniards, Italians, and every maritime nation as a fair " prey, the Greek population of the coast had at least the excuse of " retaliation when they indemnified themselves for the deficiencies of " their barren mountains or reaped with their gallies such a harvest " off those historical seas as made them insecure for more then one " generation. But, inland, their towers were amongst the most striking " features of their country. Rising alternately out of the desolation of " the surrounding hills, and the green cactus or fig trees of the villages, " the towers, in 1839 were the chief land marks of the traveller; and " each of them had its own tale of feudal warfare. Some were even " then in ruins, and some were in process of conversion to the more " peaceful purposes of a dwelling house; but the greater number retained " unaltered their old character. Some few had been built in circular " form, from a notion that that shape most easily repelled the impact " of shot, but the great majority consisted of a square tower pierced " with may slits and a very few windows, accessible by low and narrow " doorways, and not unlike in the principle, of their construction, to " the Scotch border towers containing three stories, which were connec- " ted with each other by flights of steep and narrow steps, where one " man might with comparative ease hold many at bay. As a rule, the " tower was not the place of ordinary abode: it was rather that of " refuge in time of peril: but it was often connected by one or more " courts with a lower range of buildings which served all the purposes " of the dwelling house. Sometimes, indeed, these courts were built so " high and so narrow as to enable the owner, in time of war to creep " from his tower to his dwelling house without exposure to the fire of " his enemies from other towers which rose in the immediate neigh- " bourhood: and almost always the dwelling house, though inferior " to the tower in means of defence, was so laid out with high walls, " narrow windows, winding approaches, steep stairs, and low doors, " as to render a surprise difficult and dangerous. The external appear- " ance of one of the Mainote towers, with its multitude of rival towers " must have been a very rude counterpart of some of the Italian " cities of the middle ages.

" Of these perhaps, Kita 'the city of Towers' was the most striking to " a traveller. Its inhabitants were devided into the factions of of an upper " and lower town, sometimes, at feud with each other, sometimes at feud " amongst themselves. For thirty years previously to 1839, the " best blood of Kita had been drained in a deadly and embittered strife " which arose out of an imaginary insult to a young girl whose scarf was " held too long by her partner in the dance of some village festival. For " thirty years the two factions, exterminated each other: murder " was not disguised, it was the avowed profession of every clansman and " the recognised mode of warfare; death was atoned for by death, even " to the third and fourth generation, and men continually and system-

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" atically shot down men with whom they had never exchanged a word,
" only because they were hereditary enemies.

" Happily, there were intervals to this ruthless system, in which a
" breathing space was allowed. Sometimes, through the entervention of
" a third party a truce was agreed to: the rival factions then exchanged
" knives, and the mediators immediately became the enemies of those
" who might violate the armistice.

" Occasionally, on the natural expiry of the truce an attempt was
" made to appease the feud but rarely with success. It was generally
" closed by the extirpation of one family or their flight by night.

" The evening was closing in ' writes a traveller, ' as we entered Kita,
" but the leader of our escort did not come to meet us. Elias, my guide
" said that he was probably afraid of passing at so late an hour through
" a part of the town inhabited by families with whom he had once been
" at enmity. Whilst we paused in the street, and our mules were being
" unladen, Elias observed that no lights were burnt in Kita, ' because if
" I were an enemy,' he said ' I should know where to direct my shot,"
" and suiting the action to the word, he carelessly pointed his gun to-
" wards a window. Immediately the heavy shutter was closed with a
" loud noise.

" Such were the inhabitants of this wild country, and there is
" perhaps little cause for wonder if in the fantastic superstitions of the
" Maina many of the qualities that they possessed were probably attri-
" buted to some supernatural influence of their own rugged land, and
" that even those who desired to put the most favourable construction
" upon the Mainote habits and to extenuate their evil disposition some-
" times declared that it was to be referred to the badness of the soil,
" and not to the natural temperament of its people. A Smyrniote
" merchant, it is said, who had two Mainote servants, that contrary to all
" expectation, served him well, resolved to test the truth of the tradition;
" and having sent for some Maina soil, placed it under their beds, and
" from a place of concealment listened to their conversation. Nor had
" he long to wait, for they soon arranged to murder their master and to
" plunder his property, and he then knew that the cause of Mainote
" wickedness was the badness of Maina soil. But the Mainote them-
" selves had all the passionate love for their own country that belongs to
" free mountaineers. They dreaded to leave the Maina, fancying that
" the water of the plains was fatal to them; and the story is told of a
" Mainote who, though prospering in a foreign country, sent for a little
" earth from his beloved Maina, and was so affected by the smell that
" he at once returned to his native hills.

" All, or nearly all, this state of feeling and things, has passed away.
" It was rapidly passing in 1839, though the old system could not be
" said to have absolutely expired, and the recollections of it were fresh in
" men's minds and mouths. " Thus, at Tzimova," writes a traveller

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"my host showed me my room in the tower. On pointing to a small "window he said, 'there are shutters; but you are safe they will not shoot "you.' "I could not help observing that, but for the bloodshed I "should like to have seen one of the many fights which had taken place "here a short time since. 'Oh' he said 'a word would in a moment "bring it back again,' meaning that the feeling and spirit were still the "same as in former years.' So too, at the little town of Vathia, a boy of "twelve or thirteen years old had struck a playmate; the father had "retaliated; a feud was actually being revived, and the elders held a "conference, to determine whether they should resort to the ancient "practice of an exterminating war or bend to the new system and carry "the matter for settlement before the regular tribunals. 'If' said one "of the Counsellors, who deprecated such a degenerate change of proce- "dure, much in the spirit of an English or Scotch borderer, 'If they "carry up the question to such places as these new law Courts, instead "of settling it in the old way of their fathers, there will be no end to "such matters.'"

Before parting with Lord Carnarvon's book I will give one more extract regarding the character of the Mainotes, or rather of the Greeks which in many respects is a remarkably faithful likeness to the Afghans as observed by many travellers.

"The men are with few exceptions clever and possess more general "information than might be expected from the stormy period in which "their youth has been cast.

"Every man who has attained the age of thirty has witnessed the "perilous days of the war of Independence and has often played a part "in the drama of the late revolution. Their native powers have been "quickened by the various emergencies in which they were involved, "the necessity of guarding against evil in every shape, the shifts to "which they were perpetually exposed during years of protracted struggle; "the discrimination of character, which constantly recurring peril is "sure to teach, have given them much insight into human motives "and rendered their conversation entertaining and instructive. Among "those who have thus borne an active part in the troubles of their "country, the vanity, which still, as in earlier times, predominates in "the national mind is often mitigated in its display by a tact acquired "under circumstances, when life itself sometimes depended on nice "management and correct observation of the feelings of others. But "that which has most impressed me in my intercourse with the better "portion of the manhood of Greece is an appearance of suffering derived, "I imagine, from the joyless, character of their youth, from which "every buoyant feeling has been banished, mingled with an appearance "of reflection which is imprinted on their countenances, which I have "sometimes thought attached though in a less degree to the Greek "population generally. Nor can it be a matter of surprise if the events "of those iron times have left some painful and ineffaceable vestiges

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" of their influence even on the external man. That revolution has " not spared a single family in Greece and while it established the " national independence, it fell upon individuals with unmitigated " severity and swept friends and fortune into one common abyss."

I will now proceed to give extracts from notes of different writers made mostly during the Afghan war of 1839-42, which will show how remarkable the historical parallel is between the Mainote and Afghan.

" Afghanistan is, throughout its whole extent, mountainous, and its " general aspect is that of a series of elevated, flat bottomed valleys, with, " in the vicinity of the streams some cultivation, and bounded by " spurs which are in most cases exceedingly bare and bleak. Yet " sometimes scenes of great beauty are met with, the appalling grandness " of some of the defiles to the north of the Hindukūsh is not surpassed " any where, while the soft, still lovliness of some of the little sheltered " glens on the southern slopes of that range are spoken of with rapture " by every traveller, who has visited them. Some of the ranges too in " the north and north east are well wooded with pine and oak " and the scenery in the vicinity of these is also very beautiful and " not unlike the pine clad ranges of the Himalaya. The general ele- " vation of Afghanistan is considerable; starting as it were from the " Koh-i-baba, the country, generally speaking slopes outwards and " contains in the table land of Ghuzni, and the upper valleys of the " Hari-Rud, Helmand, and Kabul River, some of the highest country " of a similar nature in the world. Sloping downwards as it does, " towards its boundaries, we find that as it gets lower, and the waters " of its rivers become absorbed by irrigation or lost by evaporation, " it becomes more desert in its character, and roughly speaking, except " in its northeast corner it is bounded in all directions, if not by a " desert at least by a belt of very barren and desert like land. For if " we go round it from Badakshan, east to Hajī Salih on the Oxus, by " Andkhui and Maimana to Herat, thence from the west of this city " to the Seistan Lake, and last round the southern border of the Garmsel " to Shāl we shall find the march of habitation every where arrested by " that most insuperable of all drawbacks to the prosperity of a country " a want of water."*

Next, as regards the marauding and pugnacious habits of the Afghans.

" The love of war is felt much more amongst Afghans, than all " other eastern nations; nevertheless, in no one instance has so little " desire been shown to augment the means of resistance and aggression. " War to them is a trade, for it would be impossible to give the name of " science to the thousand absurd proceedings which they employ and

* Macgregor's Gazetteer p. 8.

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" which prove that their chiefs are completely ignorant of the first " elements of the art.*

And again

" Pillage, fighting, and disturbances, are at times necessary to their " very existence, and are followed by long days of repose and idleness, " during which they live on the fruits of their depredations.

" If an Afghan is put to death by his Sovereign for marauding, " his countrymen look upon him as a victim; but they establish between " him who exposes his life in combat and the obscure domestic thief " who does not, an immense difference; the first is in their estimation " a brave man; whereas the other is treated with contempt, banished " from the tribe, and sometimes put to death. At first sight an Afghan " pleases, and this in spite of his rough and savage physiognomy, and " exterior; the fact is that when he has an object in view, and he has " something to gain, he knows how to play, and with great suppleness, " the part which policy dictates; but if he loses the hope of obtaining " anything out of you, it is easy to see into the details of his character, " and he will stand without scruple unmasked, and in all the aridity " of his evil nature.

"Excitement, the clash of arms, and the tumult of the combat, are "to him life; repose is for an Afghan only a transitory state of being, "during which he leads a monotonous existence; the sweets of domestic "life, mental quietude, the endearments of his family, have no charms for "him, and a life without commotion and agitation loses all its poetry. "He is only really a man when fighting and plundering; there his eye is "full of fire, his hand grasps convulsively the hilt of his sabre, and he "presses his sinewy legs against his horse's sides until the animal can "scarcely draw his breath: man and horse are one, each understands "the ardour of the other and it is difficult to distinguish which of the "two is then the most vicious.

" As there is nothing in the world of which an Afghan makes so "light as life, he hastens to live but in his own way a slave to his "passions, for who knows whether he will not fall to-morrow by his "neighbour's sword as others have fallen to-day by his?

"There is no shade of difference between the characters of the "citizen or the nomad; a town life does not soften their habits; they "live there as they live in a tent, always armed to the teeth and ready "for the onslaught, devoid of a right minded feeling, and always "animated by the most ferocious instincts. Though they are full of "duplicity one is nevertheless frequently liable to be taken in by their "apparent frankness; but a traveller is not long the victim of their "clumsy cheating which can succeed only amongst themselves, for their "minds are rather heavy than acute, strangers and particularly

* Macgregor's Gazetteer P. 67.

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"Europeans, easily see through them; their kind attentions or an "appearance of politeness to an individual, are rarely the result of a "natural and sincere feeling on their part, for they are sure to have an "interested object in view, and if they are so liberal as to present you "with an egg, it is because they expect an ox in return, if they are of "any service to you, and they ask for nothing in exchange, you will find "that the gift, or whatever the service may be. has cost them nothing, "whether trouble or money. They are hospitable to travellers, but only "because this is an ancient custom which has the force of law, and is "not a virtue which springs from the heart; those who are not in good "circumstances consider it a burden which they would willingly cast "aside, were it not that they fear public opinion; in all cases they take "every means in their power to evade it; the rich, practice it only from "ostentation, and always parsimoniously."

As regards hospitality to strangers. their feuds, notions of right and wrong, and general character, Bellew writes as follows.

"The pride, of the Afghans, is a marked feature of their national "character. They eternally boast of their descent, their prowess in "arms, and their independence, and cap all by "am I not a Puktun." ? "They despise all other races, and even amongst themselves, each man "considers himself equal to, if not better than, his neighbour. Hence "most of the bickerings and jealousies so rife in every family through- "out the tribe. In their bearing towards strangers of rank, they are "manly and plain spoken, but towards the weak and low, they are "abusive and tyrannical. They enjoy a character for lavish or at least "liberal hospitality. This they do deserve, but not to the extent they "boast of, for what passes for hospitality is, in most cases, a mere "customary interchange of services or favors. Owing to the disturbed "and barbarous state of their society, and the absence of public places "of accommodation for travellers, such as "sarais," it is the custom of the "several tribes to lodge and feed each other when travelling. Thus "guests and strangers are fed and sheltered free of all charge in the "village "hujrahs," but both the accommodation and fare are of the "simplest and least expensive kind. Strangers or foreigners generally "receive neither food nor shelter, but beg the former from house to "house, and find the latter in the mosques. In out of the way and "unfrequented localities, where the population is sparse and poor, there "is a show of greater hospitality and welcome; but it is not genuine, "and as often as not, if the guest be worth it, he is robbed or murdered "by his late host, as soon as beyond the protecting limits of the village "boundary, if not conveyed by a "badraga," of superior strength. This "badraga" is merely an armed body of men who, for a consideration, "agree to convoy travellers through their own limits. Any Mahomedan "may act as "badraga," but only the one supplied by the chief of the "district is safe, any others are liable to be attacked by rivals or enemies. "The convoy can only defend within their own limits, beyond these, "men of the next district take their place. Every tribe and their

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" divisions have their own seperate and distinct limits within which " they are quite independent of each other.

" The most remarkable illustration of the pride of the Afghān is " their exaggerated notion of their own honour, Nang-i-Pukthāna as it is " termed, any slight or insult to which is instantly resented. The exis- " tence of such sentiments among them is very strange, for they glory in " being robbers, admit that they are avaricious. and cannot deny the " character they have acquired for faithlessness. The distinctive laws of " Nang-i-Pukhtāna are very numerous, both as regards their dealings " with their own race and with strangers. the chief are, " Nanawatai," " Badal, " and Mailmastai. By " Nanawatai " or " the entering in, " the " Pukhtun is expected at the sacrifice of his own life and property if " necessary, to shelter and protect any one who in extremity may flee, to " his threshold and seek an asylum under his roof. This applies even " to the protector's own enemies, and by some tribes the asylum is " extended to all living creatures, man, or brute, or fowl; but the protec- " tion is only vouchsafed within the limits of the threshold or premises. " Beyond these the host himself may be the first to injure the late " protégé. " Badal " or ' retaliation ' must be exacted for every and the " slightest personal injury or insult or for damage to property. Where " the avenger takes the law of his victim in retaliation for murder of one of " his relatives, it is termed " Kisās." The laws of " Mailmastai " bind the " Pukhtun to feed and shelter any traveller arriving at his house and " demanding them. To omit and disregard any of these observances " exposes the Pukhtun to the ridicule and scorn of his associates, and " more especially as regards the " Badal " and " Kisās." These are " never forgotten, and, whilst aptly illustrating the revengeful spirit of " the people, show the means by which it is kept up. It is a common " thing for injuries received by one generation to be revenged by their " representatives of the next, or even by those two or three generations " further removed. Children in their infancy are impressed with this " necessity as the object of their lives."

" Compare with the foregoing the following story from Lord " Carnarvon's Journal (Page 17 to 19) about the Mainotes.

" I remember in illustration of this point, a curious story which " indicates the contrast offered by members of the same family. A chief " of the old patriarchal and feudal school, with whom I was acquainted, " possessed, a few years ago, an almost impregnable castle, in a wild and " rocky country, which he had filled with bold and devoted retainers. " A party of gentlemen connected, I believe, with one of the foreign " legation, arrived at the stronghold and was received with great " hospitality; but on the following morning, when returning to " Nauplia, was stopped by a body of men, manifestly sent from the " castle, and plundered. On reaching Nauplia, it so happened, that the " first individual met by the principal member of the pillaged party " was the son of this very mountain chief, who having received his

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" education in the town, and having even spent sometime in Paris, was " as complete a representative of Young France, as his father was of " feudal Greece. Chancing to be asked the time of day, the traveller " replied that he should have had the utmost pleasure in giving the " desired information, but that he had been unhappily deprived of his " watch that morning by his father's band; to which the youthful heir of " the robber castle is reported to have answered, with all the graceful " indifference of good soceity, that the event was equally unfortunate to " both, as it deprived his friend of that which could not easily be " replaced in Greece, and precluded him from ascertaining the time of " day exactly when he most required to know it, for the fulfilment of a " particular engagement."

And again on writing about the Ghilzais, says Broadfoot.*

" The revenging wrongs is the worst part of Pashtūn Wali, and en- " courages feuds more then it punishes aggressions. Two men quarrel in " a field, and one strikes or wounds the other, the relations take it up. " They meet on some occasion, fight and kill a man, from that moment " the quarrel is deadly, if of different tribes and the quarrel important, " the whole of the tribes go to feud.

" Semi-barbarians constantly quarrelling have always feuds on " their hands; at Pannah there are two forts of relations who are at " loggerheads. The distance between them is only 200 yards, and on " that space no one ventures. They go out at opposite gates, and walk " straight from their own fort in a line protected by its walls from the " fire of the other, till getting out of musket-shot they turn round to " their fields. Once in Zūrmat, I saw a fort shut by rolling a stone " against the door instead of with the usual heavy chain, on enquiry as " to the cause of such carelessness, the Malik, a fine old man with a " plump, good humoured face, stretched his arms out towards the line of " distant forts, and said. "I have not an enemy." It was a pleasing " exception to the rule. Feuds are a system of petty warfare carried on " by long shots, stealing cattle, and burning crops. Samson burning his " neighbour's corn acted just like an Afghān. When the harvest is " nearly ripe, neither party dare sleep. When the enemies are distant, " the feud often lasts for generations, but when they are neighbours, it " becomes an intolerable nuisance. Pashtūn Wali devises a remedy. " This is to let both parties fight till the same number are killed on " each side, then their neighbours step in, and effect a reconciliation " called " nanawat." The party who first draws blood, is looked on as " the aggressor, whatever may have been his provocation, he pays the " expense of a feast, and gives some sheep and cloth as an atonement to " the others. But in case this beau-ideal of equal justice cannot be " procured, by one party having more killed than others, the price of " the reconciliation is much higher, but it never exceeds a feast and a

* Report on the Ghilzai country and Ghuzni.

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"few virgins. These girls are not given as concubines (which the "country Afghans seldom or never have) but are married and well "treated. The expense of marriage being so heavy, to get so many of "their young men well married without expense, is a great object and a "real money compensation. The other party do not like it however, as "to give Afghan virgins without getting presents is thought a want of "spirit. A fertile source of dispute is the right to water. In Katawaz "is a spot called Khūni Karez or the bloody spring. It has been "claimed and stoutly contested by two tribes. One party would occupy "and bring crops nearly to perfection. Then a constant skirmishing "began, on one side to destroy the grain, on the other to preserve it, "but the first is more easily done than the latter. and the cultivation "was always laid waste. In these combats the water was often stained "with blood, hence its name. It now has not a trace of cultivation. "The respect for their elders is a trait in the Afghan character; and the "reason for this is, the young people are as ignorant as beasts, they "know nothing but their genealogies, and the confession of faith. "Without any means of education but their individual experience, they "for many years plough the earth and then commit crimes and excesses. "By degrees their wild independent life makes them rely on their own "judgment, and gives them an acquaintance with human nature, at "least in its Afghan form. As they get old they are constantly employ-"ed about reconciling feuds or arranging marriages, in which they have "to reason with some, flatter others, and brow-beat a third; their fine "climate and temperate habits, preserve their faculties for a long time. "They are much superior to the young or middle-aged men, and res-"pected accordingly. Pashtūn Walī, though a code good enough for "wandering shepherds,—for when land and water were abundant for all, "it tended to foster the best virtues of barbarians, and probably pro-"duced a simple, hospitable spirited race has not kept pace with "increase of population, its present influence on the Afghan character "being bad. These feuds cannot be carried on without falsehood, "treachery, and meanness, and their skulking guerilla warfare is not "favorable to courage. The hospitality daily tends to a mere worthless "form. All this is very observable in the Ghilzaie country. Zūrmat "and Katawaz pay no taxes. They give a few camels occasionally, but "no taxes like the Andars. Sometimes they kill the people who come "for the camels. The whole produce of their land is turned to their "own support; and it is notorious that in the intervals of cultivation, "they scour the neighbouring country, living for nothing, bringing back "horses, camels, bullocks, and clothes, to increase their stock; their very "implements of husbandary were a tribute in some cases from the "Karōtis. The soil is fertile and water plentiful. According to the "most approved Pashtūn Walī every man defended himself and defied "his neighbours. A country exempted from the taxes which impede "the increase of capital, and getting so much new stock for nothing, "might be expected to be flourishing. But instead, are found forts in "ruins, "karez" drying up, land ceasing to be cultivated, and tribes "returning to pasturage. Every man distrusts his neighbour, or is at

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"open feud with him. It is the custom of the country to throw a heap "of stones over a murdered traveller. In the ravine leading from Shil- "garh to Zūrmat, the frequency of these heaps is sickening. In many "cases they are to be found at the closed end of the ravines, shewing "how the poor travellers have run as far possible, and then been hewed "down. Such are Zūrmat and Katāwaz. The Andars and Tarakis "have not so fine a country."

And lastly as regards Afghan dwellings, MacGregor writes about the Dūrānis the most civilized of the Afghans *

"Almost every village surrounds, or joins to, the castle of a Khān. "These castles are encompassed by a wall of no strength, and generally "intended more for privacy than defence. They, however, have some- "times round towers at the corners; and when inhabited by great lords, "they sometimes mount swivels on the walls, and have a small garrison, "besides the relations and immediate retinue of the Khān, who, in "general, are their only inhabitants. They are built in a square, the "inside of which is lined with buildings; on one side is the great hall "and other apartments of the Khān, on the other are lodgings for his "relations, his servants and dependants, store-houses for his property "and stabling for his horses. The open space in the centre is usually "a mere bare court-yard, but, in some instances it contains a little gar- "den. The principle gardens are always on the outside of the castle, "and the flocks and herds of horses and camels, which belong to the "Khān, are kept at distant pastures, and attended by servants who live "in tents. At one of the gates of every castle is a Mehmān Khāna, or "house of guests, where travellers are entertained, and where the people "of the village often come to talk with the strangers and hear the "news."

And finally some remarks I have myself elsewhere made † of the Kakar dwellings may not be out of place here. In the Bori and Ghaz- gai valleys, the houses are of mud as in Beluchistan and Sind. In the Ghazgai valley they are all fortified after the fashion of these people, having frequently a look-out tower attached which is sometimes square, but generally circular, the entrances or doors are very low, being only 3 feet, or so, in height, and the tower has also a separate entrance of a similar construction, and round the top of the tower is a row of loopholes. In the Bori and Luni Valleys were some of the best dwellings I saw out-side of Kandahar, in all Southern Afghanistan.

They are no longer huts, but have become houses with dimensions varying considerably. They are built entirely of mud, with flat roofs, from which the water is carried by projecting spouts, they are generally fortified and have towers attached, and usually only one door. The bulk

* MacGregor, Page 238.

† Journal Royal Geographical Society 1880. Journal Asiatic Society of Bengal 1880.

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of the houses in the Bori Valley are much larger than those above mentioned, and may be described as fortified structures of mud surrounded by a mud wall some 12 feet high, and covering nearly an acre of ground. They have usually several towers attached and one door; within the outer wall are a quantity of fruit trees, and the house probably contains a whole family. Generally also there is a low three foot mud wall, extending round the fields, belonging to the house, probably for their protection. Three or four such houses often constitute a village. The fortifications of an Utman Khēl village, are often supplemented by a small regular square mud fort, with corner towers.

Forts of a similar description are also to be observed about the Sandar Khēl and Luni Territory, where the villages are generally a straggling collection of the large fortified houses above described. They have a well built, substantial and prosperous appearance, not often seen in the East. Sometimes a Malik, or petty chief, will build himself a fort, apparently as much for show as anything else. Chinā Kot in the Bori Valley is such a fort, the main interest in it, is, that it is quite new, not more than 20 years old, and so is a specimen of the modern method of Kakar fortification. It is on a small isolated hillock rising out of the valley, and is constructed as usual of mud on a rough stone foundation. Its owner is one Malik Sandi, an Alizai Sandar Khēl. The approach is by a single causeway of very rough construction, and it is entered as usual by a single door, situated so as to be easily commanded. The whole structure covers about an acre of ground.

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III.

NOTES ON THE CAMEL.

BY

CAPTAIN A. G. YALDWYN,

Bengal Commissariat Department.

Heads of Subject.

1. The different species of camels.
2. Where the different species are found, their peculiarities and characteristics.
3. The feeding of camels.
4. The watering of do.
5. The loading of do.
6. A comparison between the carrying power, the feeding and the number of attendants on camels, and the same with reference to mules and ponies.
7. The marching power of camels.
8. Camel gear.
9. Age of camels.
10. Proportion of females to males for work.
11. Shearing and oiling.
12. Branding.
13. Ferries.
14. Weight, height and length of camels.
15. The length of road taken up by camels on the march, compared with that taken up by mules or ponies.
16. Arrangement of camels in camp and cantonments.
17. Spare camels.
18. Diseases of the camel and remedies for them.
19. General remarks.

I.

Species of Camels.

There are two species of camels, the Arabian with one hump, and the Bactrian or mountain camel with two humps.

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II.

WHERE THE DIFFERENT SPECIES ARE FOUND, THEIR PECULIARITIES AND CHARACTERISTICS.

Afghan camels.

The Arabian species are to be found in Afghanistan, Scind, the Punjab, Bikaneer, and in many parts of the N. W. Provinces and Oudh. The camels of Afghanistan are strong and thick set, with abundance of hair, are short in the leg, and are better climbers and more accustomed to cold than others of this species.

Scind camels.

The camels of Scind are generally large, high and fine looking animals, with but little hair on them. They like the heat and dryness of their own arid soil, and are very susceptible to extreme cold.

Punjab camels.

The Punjab camels are very much of the same nature as those of Scind; the best are to be found north of the river Jhelum. In the neighbourhood of Hissar, there is a good class of camel known as the "Bàjri." In the Punjab desert there is an inferior description of camels known as the "Bàr ke unt." In the neighbourhood of Rajanpore, Dera Ghazi Khan and Dera Ismail Khan, good camels used formerly to be procurable, but now they are scarce.

Camels of Bikaneer, the N. W. Provinces and Oudh.

The camels of Bikaneer, the N. W. Provinces and Oudh are all equally susceptible to extreme cold and no camels of the Arabian species should be worked in India during the extreme heat of the hot season.

The Bactrian or mountain Camel.

The Bactrian or mountain camel, is distinguished by having two humps. A few may now and then be seen in India. Two camels of this species were kept at Cawnpore between the years 1838 and 1845, but were not worked, and were kept in a shed for protection from the sun. They are at home in a cold climate, and have a sort of claw toe projecting beyond the pad of the foot, which enables them to go over ice and snow with safety.

The mixed breed.

A mixed breed from the male Bactrian and female Arabian, is said to have worked well in a very cold climate, when General Harlan took 2000 camels of this description, traversing 360 miles of the Indian Caucasus, over snow and ice, for seven months, and only lost one camel, which was through an accident. If the parentage of the mixed breed were reversed viz: a male Arabian and female Bactrian, the progeny is said to be useless, being ill-tempered and disobedient.

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Veterinary Surgeon C. Steel, in his recent paper on camels, mentions the following characteristics of the animal amongst others of an anotomical nature.

"The camel is patient and docile, tolerant of abstinence on an emergency, well adapted for the imposition of loads and for traversing loose sandy ground, tolerant of rough roads, with acute sight and smell, and during progression moves both feet on one side simultaneously, which accounts for the peculiar motion experienced when riding the animal. Its flesh and milk are wholesome articles of food."

He further states.

"The camel is wanting in power behind, and cannot climb hills, or have sexual connection in any other but a semi-recumbent position.

III.

The feeding of Camels.

The feeding of camels requires as much care and supervision as is bestowed on cavalry or artillery horses. The camel is fond of green food, and the following trees and shrubs are the chief ones on which he grazes. "Peepul," "Neem," "Goolur," "Kikur," or "Babool," "Phulai," "Burgut," "Jhand," "Goolalee," "Hees," "Kurrul," "Jawassa," "Lana," "Jaree," "Karonda," "Kair," Kateela," and "Behr; of the above the "Neem" and "Babool" are the most nourishing. Young "Khaweed" or "Kusseel," "Mote" in any stage of ripeness, "Sarson" and "Tarameera" when it has seed in it, each in its proper season are very nutritious. Although Vet. Surgeon C. Steel in his paper states that camels by means of their olfactory powers will probably avoid poisonous herbs, I have frequently heard from camel men that many hundreds of camels have died from eating the Oleander bush, the "Leghunai" and the "Gungao" in Afghanistan. I have never heard of the poisonous "Akri" herb quoted by Vet. Surgeon Steel. When camels have to be fed on bhoosa and grain, owing to their being constantly worked, or to difficulties in grazing them, any of the following rations may be given.

Jungle fodder.

Green crops.

Poisonous herbs.

Bhoosa and grain ration.

Twenty to twenty five seers of missa bhoosa daily for each camel, to which no grain need be added.

or

six seers of missa bhoosa, 6 seers of white or straw bhoosa, and two seers of crushed and soaked grain or mote

or

eight to ten seers of white or straw bhoosa, and 3 seers of crushed and soaked grain or mote.

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On the march the animals should be given their rations all at once, when their days work is over. After adjusting their jhools, they may be given some of the bhoosa, they should subsequently be watered, and then be given their grain and the rest of their bhoosa for the night. Should any food remain surplus by the morning, it should be collected by each camel man and be carried on in the suleetah for future use. When camels are not worked, a small portion of the ration should be given in the morning.

Method of administering the ration.

Barley is but a poor substitute for gram or mote. I have both heard and read that a pound of ata mixed with ghee is worth twice the quantity of grain in nourishing powers; also that flour, old goor and ghee mixed up together is very nourishing. Four lbs. of barley flour mixed with the fat of the doomba sheep, and made up into balls is more nourishing than 8 lbs. of barley.

Barley.

IV.

The Watering of Camels.

The watering of camels is of equal importance to their feeding, and is not generally understood. Vet. Surgeon C. Steel states "that the store of water the animal is supposed to be capable of carrying is much exaggerated." I am quite of this opinion, for I could not help observing in the recent Afghan campaign, how little attention was paid to the watering of camels, because the idea entertained was that camels could go for ever without drinking. Such a false impression was fatal to the poor animals. Camels of the Arabian species can take in 5 or 6 gallons of water, which is sufficient for their use for about 6 days. The Bactrian species can only take in about half the above quantity. To ensure the supply, camel men travelling with their own camels, pour water out of ghurrahs down their camels throats, which the camels understand by instinct to be a necessary precaution, and take in the water willingly. It is misleading to say that a camel can go without water longer than any other animal, for he requires drink daily like other beasts, if a supply has not previously been administered. Camels have moreover a great dislike to drinking cold running water in cold weather, and therefore should be watered from holes or tanks containing still water.

V.

The loading of Camels.

The load of the camel has been fixed at 5 maunds, but their carrying power must necessarily vary with their condition. Some are not fit to carry 4 maunds, whilst others will carry 8 maunds, without overstraining their powers. Loads therefore should be judiciously divided, and in order to avoid complications, it would be sufficient to divide

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serviceable camels into two classes, viz: strong and weak, the former to carry 6 maunds and the latter 4 maunds only. This principle I would recommend as applicable to all transport baggage animals. Contractors carrying stores for which they are paid by maundage adopt this plan, because they find it answers. Camels are admirably adapted for carrying long articles, such as scaling ladders, pontoons, large double poled tents etc, and they will also carry light field guns. Vet. Surgeon Steel says "that in the South Afghan Expedition' 1878-79, he saw camels, loaded, standing day after day, because they were unable from weakness to rise, if the burden was imposed when lying down in the usual manner." I never saw this occur with the Camels of the Khyber Force during the same campaign, but doubtless laden camels were unnecessarily kept waiting and standing about, whilst the loading of others was going on. This could have been prevented to a certain extent by method in laying out the stores for loading, and by regularity in bringing up the animals in front of their loads. It is difficult, however, to lay down rules, when the circumstances under which the loading of camels is conducted in war time, are often so disadvantageous to those entrusted to carry out these duties. Laden camels when halting or waiting about, may with advantage be made to sit down and rest.

VI.

A COMPARISON BETWEEN THE CARRYING POWER, THE FEEDING, AND THE NUMBER OF ATTENDANTS ON CAMELS, AND THE SAME WITH REFERENCE TO MULES AND PONIES.

A camel's carrying power is equal to that of two and a half mules or ponies, whilst his ration is only about that of one mule or pony, taking grain and fodder together into account. Thus 500 camels only eat as much as 500 mules or ponies, and whilst the latter can only carry 1000 maunds, the former can carry 2500 maunds. Again 500 camels only require 125 attendants to be paid, clothed and fed, whilst 500 mules or ponies require 167 attendants. Thus in every 2500 maunds of stores carried by camels in lieu of by mules or ponies, there are $(167 \times 2\frac{1}{2}) - 125 = 292\frac{1}{2}$ or say 293 attendants less required, an enormous advantage in favor of camel transport.

VII.

THE MARCHING POWER OF CAMELS.

As before mentioned, camels are bad climbers, owing to their weakness behind. They are good goers in loose sandy soil, and even over stony ground, if the stones are not too large or sharp. In slippery ground they are almost useless, as they have no hold with their feet. They are very enduring when well cared for, and can go the longest marches day after day at an average speed of at least 2 miles an hour.

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They are good for fording rivers which are deep but not rapid, and where the bottom of the ford is shifting sand, the passage of a number of camels over it renders it hard and firm.

VIII.

Camel gear.

The gear of a camel consists of a saddle or "pulàn," made of taut and stuffed with straw. This together with the wooden framework and the ropes for securing the pulàn on the animals back weighs about 21 seers. The ropes are the "goorband" which goes round the camels neck, the "tang" acting as a girth, and the "dumchi" or crupper. In addition to these saddle ropes, there is the loading rope weighing about 4 seers, the jhool about 8 seers, the suleetah (if provided)—8 seers, and lastly the head stall, leading rope and nose string weighing 1 seer making a total of 1 maund and 2 seers. Were each animal further provided with a hide or chursah, it would prove very useful to soak grain in and also to cover the pulàn and jhool on the march, and save them from wear and tear, and from getting wet.

IX.

Age of Camels.

When purchased the camel should not be less than 5 or more than 9 years of age. He may be used up to about 16 years of age. Vet. Surgeon Steel states that the camel sometimes lives up to 30 or 40 years. Between 4 and 5 years a camel sheds his two front sucking teeth, one on each side of the first ones. These are full grown at 6 years, and in like manner two more teeth between 6 and 7 years, which are full grown when he is seven. The Tushes do not appear till the animal is 8 years old.

How to tell the age of a Camel.

X.

Proportion of females to males.

Female camels may be used as well as males; the proportion should be two thirds males and one third females.

XI.

Shearing and oiling of Camels.

Camels should be occasionally sheared and oiled in hot climates; this should be done by the attendants. Two seers of mustard oil and two chittacks of brimstone for each camel. One shear to 25 camels.

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XII.

Branding of Camels.

Camels should be branded on the near side of the neck, and the brands should be constantly inspected. Unserviceable animals should be branded as such on the near buttock.

XIII.

Ferries.

Camels shoud be unladen at ferries.

XIV.

Weight, height and length of Camels.

The weight of a full grown camel may be taken at 10 cwt. or 14 maunds; this knowledge may prove useful where there are weak bridges. The average height of a full grown camel is 7 feet to the top of the hump, and his average length from nose to tail is eight feet.

XV.

Length of road taken up by camels on the march.

A string of 500 camels covers about one mile of road. Whilst 500 camels carrying 2500 maunds cover only one mile of road, 1250 mules or ponies carrying 2500 maunds, would cover about 2 miles of road. This is another advantage in favor of camel transport.

XVI.

Arrangement of camels in camp and cantonments.

Camels when in camp or cantonments and not at work can either be arranged in lines facing one another or in circles heads inwards. The latter plan economises space and sentries at night, besides being more secure in itself from the nature of its formation. A circle with a radius of 11 paces will contain 50 camels placed inside the circle, heads inwards, and leave abundance of room for food, gear, and attendants.

XVII.

Spare camels.

The scale allowed of spare camels on service is 10 p. c. Spare camels should not be unnecessarily laden on the line of march.

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XVIII.

Diseases of the Camel and remedies for them.

But little appears to be known by Englishmen about the diseases of the camel, and whatever I may write concerning them has been derived either from observation or from native sources. The most common diseases are.

1. Dysentery
2. Pneumonia
3. Itch
4. Eating away of the nose.
5. Cold struck.
6. Heat struck.

1. *Dysentery*, brought on by cold, neglect and hard work.

The native remedy is Sarson ka Tel
Crushed Huldee
Ata

mixed up together, and made into balls. Vet. Surgeon Steel recommends a quart of castor oil, often repeated, and if the purging is not checked,

Opium	...	...	...	...	...	1 tola.
Bhang	...	...	...	...	...	4 tolas
Turmeric	...	...	...	...	...	24 „

divided into eight doses, one every eight hours.

2. *Pneumonia*, brought on by extreme cold, hard work and neglect
The native remedy is Kala ziree
Lassan
Metee
Salt

given dry, by throwing it down the animals throat, in the morning.
Vet. Surgeon Steel recommends.

Henbane	...	...	...	...	...	6 tolas
Dhatura seed	...	...	...	...	...	1 tola
Turmeric	...	...	...	...	...	24 tolas
Mustard seed	...	...	...	...	...	24 „

made into 18 balls and given one at a time, two or three times daily.

3. *Itch.* The animals suffering from the disease should be isolated their hair shaved off, and a mixture of the following should be rubbed into the skin.

Gundhak
Sarson ka Tel or Tara meera tel
Chok

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4. *Eating away of the nose.* The nose becomes infested with maggots, the off-spring of vermin, deposited by flies. The native remedy cures a badly eaten nose in a few days, if applied twice-a-day. It is made up of :—

Bilawa
Akh leaves
Tara meera tel
Tootia

5. *Cold struck,* is a common complaint amongst camels that get cold after being heated. They often become incapable of action.

The remedy is a mixture of :—

Goor
Meetha tel
Màl Kangnee.

6. *Heat-struck,* is common in the very hot weather. The natives call it "Sargaya." The crispness goes out of the hair, and the hair of the tail comes out on being slightly pulled. Want of water and over work in the heat is the cause of this disease. The native remedy is a handful of green tel soaked with a little salt all night, and poured down the camel's throat in the morning. If tel cannot be procured, a pound of ardawa may be used instead. Many camels die of this disease.

There is only one other disease that I will mention, which is called "Tap larjà" by the natives. When a camel has a "tap larjà" he is said to shake all over, fall on the ground, and if he does not die within a few hours, there is a chance of his recovering in two or three days time. The medicine used is "jaiful" and "goor." Camel men say that this disease comes with a particular wind, and they brand camels suffering from it with three straight parallel lines, on both flanks and on the head, in the superstitious hope that the animal may thereby recover.

XIX.

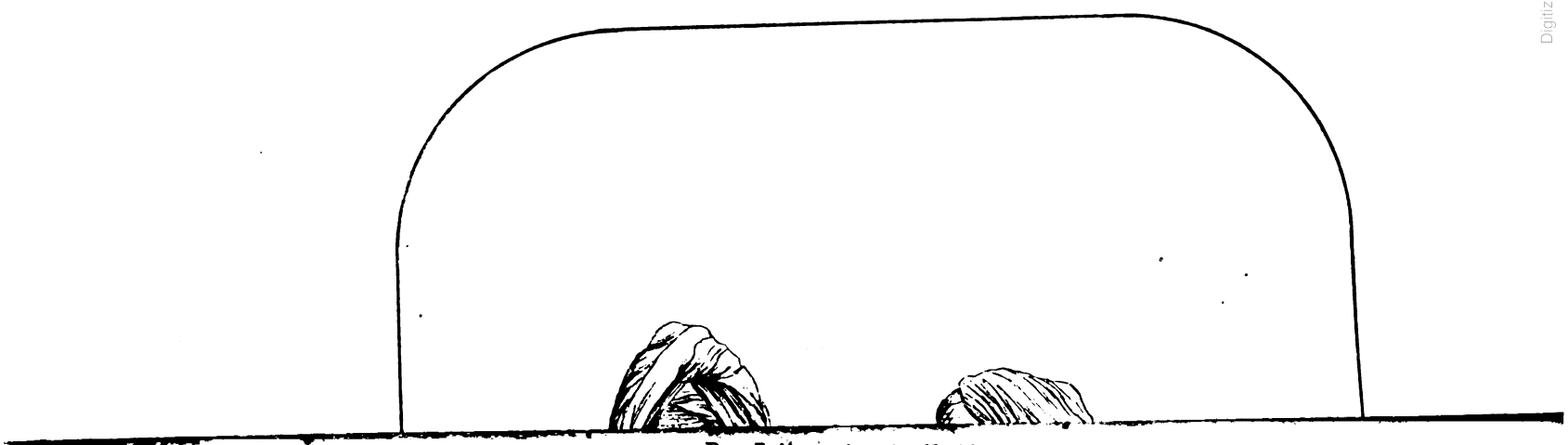
General remarks.

A great deal more might be written about the camel by any body better acquainted with the subject than myself, and it is to be hoped that this will soon be done, and that officers who have the care of camels, and that the camels themselves may benefit thereby.

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TWO BASHGELI KAFIRS.



Dr. Leitner in April 1876.

FROM A PHOTOGRAPH.

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A SKETCH OF
THE BASHGELI KAFIRS AND OF THEIR LANGUAGE.

BY

G. W. LEITNER, LL.D.,

Late on special duty in Kashmir, &c., on a mission of linguistic enquiry, by order of the Panjab Government.

SIMLA, 5TH SEPTEMBER 1879.

IMPERFECT as the following Sketch may be, I submit it for the use of those travellers who, like Major Tanner, are attempting to enter Kafiristan by way of Chitrál. "Davies' Trade Report" informs us that the Bashgeli Kafirs live under the rule of Chitrál, whose Chief, Aman-ul-Malk, sells members of that race from time to time into slavery, in order to raise his revenue. I believe that these Kafirs, whose language, Kalásha, is spoken, or at any rate, understood, by neighbouring independent Kafirs, would be an excellent medium of communication with the more distant tribes. In order, however, to obtain their confidence it is necessary to know a little of their language, which, in wild as well as in civilized countries, is the key to sympathy and information. Dr. Bellew has given us several amusing instances of the difficulty of eliciting from a Kafir, with whom he could converse in Persian, the equivalents even for objects that can be counted or pointed out or for the first three persons of the present tense of the verb "to be." The difficulty which I encountered in endeavouring to elicit grammatical forms from the Kafirs, altogether five in number, whom, for various brief periods between 1866 and 1875, I had in my service, may, therefore, be appreciated.* I shall be content if this sketch

* First point to objects in order to learn their names, then bring them in connexion with such simple bodily wants as can be indicated by gestures. This causes one of the men, if there be two, to order the other to bring this, that or the other, to come, to go, &c., which elicits the imperative form.

The reply ordinarily gives either an affirmative or the first person of an indicative present or future. Of course, the same sound or the inflection of the same word has to be closely followed. Then use yourself the first person, which starts conversation and brings out the second person and so forth.

I cannot understand the difficulty in getting Dr. Bellew's Kafir beyond "ten." Having been told "one" and "ten," "eleven" follows as a matter of course, *e. g.*: the questioner repeats: "one, ten" on which the Kafir laughs; this warns the questioner to invert the order and to say "ten, one" which the Kafir would immediately take up and correct into "ten *and* one," giving one the benefit of a conjunction or of the *inflection* of ten, which *may* be a guide to a genitive and is sure to be of *some* use hereafter. The difficulty with Kafir numerals arises at quite a different stage. That Dr. Bellew's Kafir could not translate "I am" "thou art" "he is" is more intelligible. The verb of existence can rarely be ascertained in this way. It must be sought for through the correction of sentiments like "Kafir good" "Mussulman bad" "I, thou, brother" (with appropriate gestures between the words) and so forth. Of course, one is constantly misled by one's own stupidity or the misapprehensions, if not the evasions, of the person interrogated, even at the above elementary stages of enquiry; nor is there a royal road to the acquisition of the language of a barbarian, even when one's task is greatly facilitated by his knowledge of a common medium of communication. Circumstances, which cannot be predicted or always arranged for, must be made use of, as they arise, in order to give freshness to one's work. Above all, the enquirer must have learnt to distinguish between the thought and the word which expresses it, for which his best preparation is to have acquired in early life a familiar knowledge of, at least, two languages; otherwise, the application of philological rules will suffer by the ossified condition of the mind of the investigator.

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of one of their languages serves as a starting-point for further research and saves a future traveller the first and almost unsurmountable difficulty of inflecting a noun or verb, or of constructing a sentence. My "Dardistan," the first part of which was published early in 1867 and of which the present sketch is, in part, an extract, has, I am glad to find, served as a pioneer for the labors of subsequent travellers and residents, without which their efforts must have been somewhat barren of results. This fate may be predicted for researches in the remaining portions of what was once called "the neutral zone," unless all the existing material, especially the linguistic portion, is published as a basis for the labors of our explorers, whose pluck is as undeniable as is their general inability to acquire a new language. Even the most distinguished amateurs in philology make such mistakes as to render the abstract term "death" by "a dead policeman" or to give the puzzled answer "what do you want" as the equivalent of their enquiry about the native name for "middle finger." Persons sent on special expeditions often pass by the most interesting inscriptions, of which they merely report that "the characters are neither Greek nor Persian," instead of obtaining, if it be only a rubbing on a bit of paper of one of these characters. Every information, however fragmentary, should be welcomed. I understand that Major Tanner is ill near Gilgit, and, if this be the case, or if there be still time to communicate with him, the opportunity may be taken of drawing his attention to the Bashgeli Kafirs, with whom he is likely first to come into contact and from whose co-operation, under judicious management, his mission is likely to receive an additional element of success. I also hope, that in the transliteration of sounds, Major Tanner will adopt the spelling usual in ordinary English words (explaining, of course, his system by prefixing examples to his work) and that he will avoid the Hunterian method which presupposes a correct knowledge of the nature of sounds, but which, by misusing the accent, confounds pronunciation with accentuation, *viz*: the rendering of the sound with the syllable on which stress should be laid.

The two Kalásha-speaking Kafirs in my service were, the one, a subject of Chitrál, the other an independent Kafir. They were both prisoners obtained by His Highness the Maharaja of Kashmír in the course of his war with the tribes beyond the Indus in 1866, of which details may be read in my Dardistan, Part III. The men were called Batshu and Malek respectively, and looked like Hindus of the Himalayas. This bears out the statement of Drs. Bellew and Trumpp that the Kafirs were originally Hindus, a view with which I only very partially agree. They were placed at my disposal by the Maharaja, at the instance of the Panjab Government, and lived in my house at Lahore for several weeks, during which time, however, I could only send for them on about a dozen occasions. Finally, the heat of the plains drove them back to their bondage in Kashmír. The men were well-behaved, though they boasted that in their country they literally drank the blood of a slain Muhammadan and bit his heart, I presume,

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more from bravado than from that penchant to cannibalism, with which they were credited previous to my tour in Dardistan in 1866, and which even one Dardu tribe erroneously ascribes to another, although it may only be separated from it by a single mountain. Many of the notes which I put down in 1867 are now lost or have been rendered illegible by the lapse of time, whilst none can now be sent for from Lahore; but I remember that one of the youths had light eyes and was fairer that an ordinary high-caste Hindu of the plains. As regards their religion I have elsewhere given one of their prayers, but it seemed to me that their ideas had become affected by their passage through, and stay, brief as it may have been, in Kashmír, when they must have come in contact with Hindus, who, knowing that they were bitter enemies of Muhammadans or, at any rate, not Muhammadans, tried to make them believe that they were themselves Hindus, in pursuance of that proselytizing policy of Kashmír to which I have alluded elsewhere.* The two Kafirs spoke of Indra and Mahadeo, but it is possible that they were taught these names in Kashmír, although I must admit that the account which my Munshi obtained from them and which I have added to this Sketch, agreed with that of other enquirers into the religion of this mysterious race (*pace* Dr. Bellew). All the Kafirs that I met seemed to me to be devoid of any very active spirit of religion. Jamshêd, the nephew of General Feramorz, pretended that he was a Christian, and asserted that his uncle used to assemble once a week the Kafirs in the service of the Amír of Kabul, and to tell them that Jesus was the Son of God, and that hymns were sung on the occasion. Ghara, the man to whom Dr. Bellew has referred in the course of his Lecture as not having been heard of after his return to his country, has since corresponded with the Missionaries of Peshawar and has asked for Christian Instructors, of whom two, Fazl-Haq and Nurullah visited him at his village Shaidarlam (*vide* account elsewhere). What I elicited from the two Bashgelis was: (1) that they put a stone on to a cairn on the top of a mountain to which they proceed once a year as a religious exercise; (2) that the number of Muhammadan heads hung up in front of their doors indicates their position in the tribe (this was confirmed to me by

* My experience bears out a similar statement made by Mr. A. C. Lyall, Foreign Secretary to the Supreme Government, in a well-known discussion with an illustrious philologist. Of these attempts by Hindus to proselytize I wrote in 1869: "I have already noticed that, in spite of the exclusiveness of Hinduism, attempts are made by the Maharaja of Kashmír to gather into the fold those races and creeds which, merely because they are not Muhammadan, are induced by him to consider themselves Hindu. For instance, the Siah Posh Kafirs, whom I venture also to consider Dards, have an ancient form of nature worship which is being encroached upon by Hindu myths, not because they are altogether congenial, but because they constitute the religion of the enemies of Muhammadans, their own bitter foes, who kidnap the pretty Kafir girls, and to kill whom establishes a claim among Kafirs to consideration. In the same way, there is a revival of Hinduism in the Buddhist countries of Ladak and Zanskar, which belong to Kashmir, and ideas of caste are welcomed where a few years ago they were unknown. As no one can become a Hindu, (except through the creation of an additional caste), but any one may become a Muhammadan (with full privileges), Hinduism is at a natural disadvantage in its contact with an advancing creed and, therefore, there is the more reason why zealous Hindus should seek to strengthen themselves by the amalgamation with other idolatrous creeds."

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the sepoys of the Maharaja of Kashmír on my way to Gilgit in 1866); (3) that they sit on benches or stools and not on the floor; (4) that they like all those who wear a curl in front; (5) that they are great wine-drinkers, in which respect they resemble their brethren, the Dards. Dr. Bellew's account seems to confirm my worst anticipations regarding the absorption of these races of whom I thus wrote in 1869:

"To any one interested in the remnants of an ancient civilization, the absorption of the Dard races which is now going on is naturally a melancholy event. The legends and songs which I collected at Gilgit in 1866 will not live for many generations after most of its inhabitants have been dispersed to more savage or more "orthodox" regions, or have completely come under foreign rule. The Muhammadan Afghans will encroach on the inhabitants of the Hindu Kush, till the last blue-eyed "Kafir" girl has been sold into slavery (perhaps by her own father as an act of propitiation of his Muslim neighbour) or till the monotony of Islam has smothered the national life which resisted the attack of Timur."

The earliest reference to the Kalásha Kafirs is made by Mackenzie Turner who says: "the Kafirs are divided as follows:

1. Kamozáes, in hills round Chitrál;
2. Kullush, near Chillas and Gilgit;
3. Kuttars, near Kunur;
4. Gumbír, above Lugmán."

His No. 2.—I read as follows: "Kalásh near Chilás and Gilgit." These are my Kalásha Kafirs, whilst it is as obvious as it is a correct statement, that the Kataris live near Kunar and that Gambír is above Lughmán. (*vide* Nos. 3 and 4 of Turner's division of the Kafirs, which, on the whole, seems to me to be the one most likely to be in accordance with fact.) I have added Photos or drawings of Kafirs from Kalásh, Katár and Gambír to the present Sketch for purposes of comparison. My Kalásha said that they lived in a country called *Mumurèt* (which I have put down as a village in my vocabulary,) whilst the name of the Kalásha District, partly still inhabited by Bashgeli Kafirs, occurs on my map prepared on information gathered by me between 1866—72, and which continues to be the one that contains the greatest number of names of places and has served as the (unacknowledged) basis of several official maps and routes prepared during and after that time, as can be proved by the quotation of misprints and the misapplication of linguistic to geographical appellations. Near this country of *Mumurèt* they said the following places were well-known: these my Munshi put down as Broana, Uneegá, Butrik, Khurkhura, Regmoon, Bario, whilst my simultaneous notes on the subject are either lost or mislaid and my vocabulary has only Rongmù and Biriù, which I take to be the Munshi's Regmoon and Bario. The inhabitants of *Mumurèt*, Rongmù and Biriù are allowed to intermarry.

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The Kafirs, whom my Munshi called "Kala Sheha" Kafirs, informed us that they worshipped *Mahadev*, to whom they built a stone-temple, which they visited for purposes of prayer. Females were not allowed to go to the temple. When the Kalásha Kafirs want to eat meat, they take a goat to the temple, where they kill the animal with a blow from a sword. (This agrees with similar accounts regarding other tribes of Kafirs.)

Their Gods, my men said, were Mahadev (as above), Hingo, his brother and Indr, to which statement my Munshi adds Kishmaee and Khudaee, *viz.*, Indr-Kishmaee and Khudaee.

The Kafirs said to the Munshi: "we do not allow travellers to pass through our country, because the Raja of Chitrál sells us as slaves and so do his people whenever they can catch us. When the "chotee" (lock of hair, like that worn by Hindus) is found on the head of a stranger, we treat him with courtesy, but if he do not wear it we kill him. Our religion is not founded on any book and we are ignorant of reading and writing."

The Munshi further reports: "their marriage custom is very curious. If the parents of the girl are poor they say to the parents of the boy: "please not to come to our place, we shall come to yours with our daughter for the marriage ceremony"; but if, on the contrary, the parents of the girl are rich, they send for the parents of the boy and treat them with the greatest hospitality."

The women wear a *kurta* like the Kashmiris and a *topi* like that of the women of Gilgit and Chilas. (All, and only, the Dardu tribes wear this cap, which is a bag, sometimes of embroidered cloth, rolled up over the ear). The Kalásha women, however, add strings of cowries round the common Dardu cap. This cap is another proof of the Kalásha Kafirs belonging to the Dardu race.

The following are the products of their country: Wheat, Rice, Mungi, Mah, Barley and Corn. Nothing grows there except these; they have grazing grounds for their goats and live on them.

As regards the tribal divisions among the Kalásha Kafirs, my Munshi's notes are as follows. "They are divided into the following sects: *Throokdaree, Shala-kú-daree, Bollya-sing-now, Ráchá-ví-now, Bodee-daree, Bambooree-now, Rachagoshdaree, Isprenow, Nájuk, Muràlee.* Among these castes the *Throokdaree* is considered the best, like the castes of Brahmins and Thakurs among Indians, *Bambooree-now* and *Isprenow* are considered the most gentle sect."

My own notes agree so far with those of the Munshi as I put down the *Torikdari* as one of the two high castes. They are evidently his *Throokdaree*; but he has not given the other high caste, namely the

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Butidárî, evidently his *Bodee-daree*. My *Shalek-dari* is evidently his *Shala-kú-dáree* and my *Bamburnaù* his *Bumboorse-now*, but my *Rajawári* is omitted, unless it is the same as his *Ráchávi-now* or his *Racha-gosh-daree*, whilst I cannot find my equivalents for his *Ispre-now*, *Najuk*, *Muralee* and *Bollya-sing-now*.

When a person dies he is put into a box and then placed in a distant jungle. They do not bury or burn their dead. (This agrees with what is reported of the customs of other Kafir tribes). The nearest kindred of the deceased keep deep mourning for forty days. When a father dies, his son shuts the door of his abode and confines himself to his room for forty days. When this period is past, some man of standing in the tribe takes the son out of his room, gets his head shaved and washed, has new clothes put on the mourner and consoles him.

When a son is born, great rejoicings take place. Guns are fired off and large parties are entertained to dinners. The mother of a new-born son secludes herself for twenty days, but if she has given birth to a daughter, her husband confines himself in a house for the same period. Similar practices contingent on menstruation and gestation have been reported from other Kafir tribes.

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A GHILGHITI.

Wearing the usual Dardu Cap, alluded to in this Sketch

FROM A WOODCUT.



A SIAH POSH KAFIR.

(Probably from Gambir) when visiting Peshawur.

PHOTOZINCOGRAPHED AT THE SURVEYOR GENERAL'S OFFICE, CALCUTTA, DECEMBER 1879.

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VOCABULARY AND GRAMMAR OF THE LANGUAGE OF THE BASHGELI KAFIRS.

A VOCABULARY AND GRAMMAR OF THE KALASHA LANGUAGE

FOLLOWED BY

Dialogues and a philological Sketch of that language as well as a brief "Comparative Vocabulary and Paradigms of Kalásha, Gilgiti and Arnyiá."

1.—NOUNS.

English.	*Kalásha.*
Abode	... hand.
Arm	... hárkin.
Almond	... biyels.
Altar	... hand ? hénd=temple.
Apple	... roshonáu.
Ass	... gordok.
Apricot	... ajái.
Air	... sina (word) shílak.
Ant	... pililek.
Arrow	... bro; shingtom=bow; the wooden part=tshong.
Beard	... shà.
Bear	... itz.
Breast	... gro ; tshútshu.
Boy	... sudá.
Girl	... strija gurok.
Brave man	... goatlnn.
Bird	... patshenk.
Blood	... lui (niao).
Boat	... drin (leather bladders).
Bone	... atì
Brass	... harila
Bridge	... shín ?
Brick	... mundì.
Bread	... awù.
Brother	... baya, báy
Buffalo	... (there are none).
Butter	... pratshno.
Bride	... ajakarí (bride) ; strija (wife.)

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Bridegroom ... purush.
Business ... krorùm, kròmm.

Cap ... kúrr.
Cold ... tramóna (?).
Cavern ... krée.
Cure, medicine ... wezì.
Cheeks ... kâli (?).
Cheese ... pìnda (?).
Clothes ... tshéu (distár=turban ; piràn= waistcoat; butt=drawers.)
Comb ... kandayak.
Country ... dêsh.
Coward ... biheuder; bibu.
Cat ... púshak.
Cloud ... bashik, (rain) méndji.
Candle ... lutsh (light).
Copper ... gondali (dish) tshukura.
Cotton ... krawas.
Cock ... kakanwàk.
Cow ... gak.
Curds ... niú.
Crow ... kagra.

Darkness ... tramashùng.
Dish ... kurri; gondali?
Dance ... nàt.
Dekchi (kettle) ... kawao.
Door ... duòr (?).
Daughter ... tshnù.
As an exclamation ... tshû.
"Oh little girl" ... dada.
Day ... básan; adoa rátau=night.
Dog ... sheon.

Eye ... étsh.
Eyebrows ... cjganduk.
Eyelid ... etshpéhluk.
Ear ... koron.
Earth ... tshòmm.
Soil ... do. páo.
Khadai, Mahadéo-Indr, Kushumia, Hingáo. } Names for God and portions of the universe.
Enemy ... dushman.
Egg ... ondrak.
Evening ... trmush.

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Finger	... ango.
Father	... wawa.
Fire	... angár.
Flame	... gulshpì.
Fish	... matzí.
Fly	... mangajík.
Flower	... ghambúri.
Flour	... at, átt.
Foot	... kúrr (dheink=leg); kushurek=knee; broink=thighs.
Fort	... kòtt (héud=temple).
Ford	... ùguni, wazái.
Fruit	... mewá.
Friend	... dari (?).
Forehead	... nila.
Food (bread)	... áu.
Garden	... gurzenn.
Goat	... bíra.
She-goat	... pài.
Gold	... soa.
Grass, hay	... káss, shàshta khàss.
Green grass	... grìla khàss.
Gun	... topèk, tupèk.
Hair, curls.	... tshui; tshurí.
Hand	... peen ? pilon.
Head	... shish.
Herald (messenger)	... khabàrero.
Honey	... matsherik.
Heat	... huluk (?).
Heaven	... dí, asman.
Horse	... hàshsh.
Hut	... tshittak hand (little house).
House	... ghona hand (great house).
Heart	... héra.
Husband	... berù.
Iron	... tshimur.
King	... shá, shah, shah gúrok.
Lead	... adzis; bullet=brô; wêz=powder.
Language, speech, word	.. mondr.
Lake	... sardawai.
Leaf	... prón.
Leather	... gao.
Leopard	... joao.

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Light ... pralik, lùss
(of a candle) ... lùtsh.
Lightning ... win (prau) dedayang=thunder.
Limit ... khonda.
Lips ... úsht.
Load ... phar.

Man ... kúshala.
Male ... púrush.
Marriage ... dja.
Meat ... móss.
Milk ... tshìrr.
Medicine, cure ... wezì (?).
Mill ... yjónter.
Monkey ... mrakro.
Moon, Month ... mastrúk.
Mother ... aya
Mountain ... sònn.
Great mountain ... ghona sònn, ghano sònn.
Mouth ... usht.
Mist ... mendjamò.
Musquito ... mengajik.
Musical instrument ... wádj (bandjai=play.)
Morning ... tshaupami ; tshanpa=to-day ; ondja=to-morrow.
Model ... (nora=new ; lajna=old).

Neck ... torr.
Name ... hòm (?) nòm.
Night ... ratt.
Nose ... natshor.
Noise ... hunk ; húk.

Oath ... shatt ; kshullo manhandei (?).
Oil ... teue.

Property ... mál.
Pain ... tripálle.
Perspiration ... húlluk.
Place ... awata (?).
Plant ... kandálek.
Price ... qrê ?.

Rain ... báshik.
Ring ... angúshter.
Reward, present ... saripá.
River ... gá ; boboyùk.

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Rope ... radjùk.
Road ... ppiònn, pònn.
Rule, custom ... dastúr.

Salt ... lòn.
Sabre ... kangár.
Service, work, ... kròmm.
Sheep ... mèsh.
F. ... amea, amrea.
Saddle ... hunn.
Servant ... sháderr.
Shoe ... kalum.
Saw ... gir.
Silver ... rúa
Spring ... bassum.
Sister ... baba.
Skin ... pói.
Spring (water) ... ùtz.
Sky ... dì.
Spy ... hériu.
Stomach ... kùtsh.
Smell ... bó.
Snake ... gókk.
Snow ... kirik.
Stockings ... djerab.
Son ... putr.
Song ... grò, qrôn.
Sport ... mnrù (?).
Star ... tari.
Stone ...
Great stone ... ghona batt.
Little stone ... to hutek ? (tshíttak) batt.
Sun ... suri.
Silk ... sikimm.

Tax ... thangi.
Temple ... hénd (?).
Thunder ... didayàng.
Tiger ... juáu.
Time ... waqt.
Tobacco ... tamakù.
Tongue ... djìpp.
Tooth ... dandoork.
Town ... Shahar (?)
Little town, village ... gròmm.
Tree ... mùtt.
Trial ... djóni (?)
Tribe ... zàttr (?)

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Tribute	... thangi.
Turban	... distar.
Village	... gromm.
Voice	... kondyek.
Water	... ùk, ùg.
Wall	... dighıa.
Wine	... dà.
Winter	... hémman.
Wife / Woman	... strija.
Wood	... shulà,
Wolf	... grhast.
Wool	... pàsh.
„ goats	... mro (?)
Word	... mondr.
East	... sún prau.
West	... tshakk (prau).
Right	... drántsho.
Left	... karúi.

2.—NUMERALS.

1	... ék.
2	... dú.
3	... trè.
4	... tsháu.
5	... pondj.
6	... shé.
7	... sàtt.
8	... asht.
9	... nò.
10	... dash.
11	... dajéga.
12	... daje dúa.
13	... „ tréa.
14	... „ tsháua.
15	... „ pondja.
16	... „ shoa.
17	... „ satta.
18	... „ ashta.
19	... „ nóa.
20	... bishi.
21	... bishíje ek.
22	... „ dú.
*30	... „ dash.

* 31—bishije-daje-ega.
32— ditto dua (compare with 11, 12, &c., &c.)

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40	... du bishi.
50	... du bishi dash.
60	... trebishi.
70	... „ dash.
80	... tshau bishi.
90	... „ „ dash.
100	... pondj bishi.
200	... dash „
1,000	... no term for a thousand.
1,00,000	... ditto.

(*b*). *Ordinals, &c.*

First	... égis (?) shumerau.
Second	... pishtan, égis pishto (the one after the first.)
Third	... motshe or doim pishto=the one after the second ; motshuna.
Fourth	... trein pishto=(the one after the third.)
Fifth	... tshouin pishto.
Half	... khónda.

3.—Names relating to time.

Day	... báss.
To-day	... óndja.
Midday	... áduo.
Tomorrow	... ghêri (?) tshópa.
After tomorrow	... torie.
Yesterday	... dosh, dòsh, doshtshópa.
The day before yesterday	... warèsha.
Week	... sahant ; satt basan.
Fortnight	... khonda mastrukh ; du sahant.
Month	... mastrukk.
Year	... kau.
Spring	... basun.

There are no names for the days of the week. There are two main divisions of months : the summer and the winter months : "only the great men know their names."

4.—Adjectives.

All	... tshikk.
Broad	... bìrr.
Little	... tìtshek.
Long, great	... dîga.
Loud (voice)	... hútala.
Crooked	... koròk.
Clean	... pagizá.
Sideways	... koro-khà.
Straight	... ûdjak.
Dirty	... nazî.

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Dry	... shûshta.
Deep	... gùtt.
Wet	... grîla.
Far	... dêsha.
Near	... tàdaka.
Necessary	... ghattu (?).
Good	... prusht.
Great	... drîga.
Beautiful	... shishòyek, also prusht.
Bad	... khàtsha, shàla.
Much, very	... bó.
Hard	... phaugîna
Ugly	... nazgústi.
Soft	... maúntshak.
Poor	... ghariblèy.
Generous	... prùsht mótshi=good man.
Liberal	... tshîkin.
Rich	... daulanman.
Heavy	... agûroka, ugúrako.
Light	... tzátak.
Hot	... hùluk.
Cold	... ôsh.
Healthy	... streká (?).
Hungry	... anôra.
Miserly	... káske né dalé=he gives to no one.
Thirsty	... daán, dáhán (?)
Low	.. passt.
Large	... ghoná.
High	... hútala.
Small	... shimundyeká, tshútek.
Ill	... zabún (?) bey-derkár.
New	... nòra.
Old	... lájna.
True	... ûdjek.*
False	... lewallè.
Quick (make haste)	... adihái.†
Quick (come quickly)	... kasháp.
Slow	... briâsh.
Raw	... dónga.
Ripe	... patshilalè.
Rough	... hèrra.
Smooth	... lánsht.
Round	... pindûri.
Square	... tsháu gróni.
Sweet	... máhora.

* Udje móndr de = speak the truth.
† Adihai pari = be quick.

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Sour	... tshúkra.
Bitter	... tshíshtak.
Thick	... bá tûla.
Fat	... tûla.
Thin	... palîtshok
[A lean man]	... phaugîna.

(*b*). *Names of Colours.*

Red	... latshéa.
Yellow	... badù.
Blue	... nila.
Green	... harílek.
Black	... krìina
White	... gora.
Pink	... zámutsh.
Many coloured	... tshìkmishàri.

5.—Prepositions, &c.

Above	... hutale ; hallia.
Beneath	... hemmen.
Between	... môsthe.
Before	... rû
In former times	... jôtt ; tshîra.
Behind	... pìshto.
In future times	... sumbèrr.
Within (come)	... udrîman (í) = come inside.
Without (go)	... binàk (pári) = go outside.
Here (come)	... ayà (i) = come here.
There	... prahàkk.
Where	... kawái (paráo) = where did you go ?
Now	... shóndje (i), this time = shondje n'oa
When	... kái (ómi) = when did you buy it ?
Who	... kûro (tú) = who are you ?
What	... kîe.
Which	... îe kura, = which is it ?
This	... eka yáso.
That	... eka tráso.
Why	... ka [parizdai] = why do you go ?
How	... khènti.
How many	... komón (*!*).
Yes	... *

* There appears to be no word for "yes"; at any rate, I could not get anything more satisfactory than the following :—

Q.—Awú dshis ? Have you eaten bread ?

A.—Awù dshim. I have eaten bread.

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No ... nè
And ... je (?) (added to the word like Latin que).
If ... (is rendered by a correlative sentence—vide dialogues).
But ... tá.
Or ... kói (amuprèm).
As ... shála (krom) = جيسا كام
So ... aísta = يسا
Also ... ásta (?)
Always .. harr adoa.
Until ... nù, (at end of sentence).
Again ... gêri.
All ... tshikk.
Therefore ... kéy krómna.
Why ... shü kromna.
Little ... títshek.
Much ... bó.

6.—Pronouns.

I ... a.
Of me ... mái.
To me ... mótshes.
By me ... mái tada.
From me ... mái pì.
Me ... mái.

We ... abì (atshikk=we all ?)
Of us ... hómo.
To us ... hóma.
By us ... homo-táda.
From us ... hómo-pi.

Thou ... hómo (djagai=see).
... tu kushalatai.
Of thee ... tái.
By thee ... tái táda.
From thee ... tái pì.

You ... abstshikk.
Of you ... mîme.
To you ... mimi.
By you ... mimi-táda.
From you ... mimi-pi.

He ... ásá.
Of him ... ásá.

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To him	... ásá.
By him	... ásá-táda.
From him	... ásá-pì.
They	... shéli.
Of them	... ísi.
To them	... ási=shási.
By them	... shasi-tada.
From them	... shási-pì.
She	... ása.
Of her	... ása.
To her	... ása.
By her	... ásá-tada.
From her	... ásá-pì.
They f.	... like the masculine.

7.—The Verb.

(*a.*) *Imperatives.*

Bring	... óni.
See	... djagái.
Go	... prè, pári.
Give	... dé.
Sit	... nisì.
Be silent	... hùk mû káre=make no noise.
Hear	... sangâs; kronn kares=give your ear.
Eat	... jù.
Take away	... hári.
Cut	... tshîni, tshínni.
Come	... ì.
Drink	... pì.
Stop	... mô páre=do not go.
Do	... káre, kári.
Ask	... putshná (?) pùtshi.
Look	... djagái.
Play (the dôl)	... wàdj bandjai.
Run	... kasháp parí=go quickly.
Laugh	... kátras, krátas.
Light	... uprái.
Weep	... tróy.
Dance	... nàt kari.
Sigh	... pûshi.
Speak, read	... monnde (monn de?)
Beat	... láy.
Bind	... bóni, bhóni
Kill (strike dead=hróy istó)	... hróy.

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Open	... umrái.
Stamp	... pogroln dè.
Sing	... gròn dié, gròn dé.
Sleep	... prasúy.
Shut	... kári.
Get up	... úshti.
Fall	... shirúus.
Lift	... uprái.
Wake	... úshti.
Weigh	... terázu tóli.
Write	... niwéji, niwéje.
Understand	... djeóni
Unfasten	... ukashi.
Awake	... úshti.
"	... spropthétum.
Die	... náshi.
Lock	... durr kári, nal kári.
Unlock	... nal umrai.
Want	... gáti (?).
Raise	... uprái
Catch hold	... grii, (hàsh grii.=catch hold of the horse.)
Sell	... brínn kíràs.
Let go	... lasái.
Tear, break	... tshíni.
Sow	... si.
Throw away	... histi.
Boil	... halái, wîsho dé.
Roast	... sù de.
Do not forget	... mò práshmos.
Blow	... phushe.
Call	... tshìn.
Cook	... au kare,
Count	... ijmaráy.

(*b.*) *Infinitives and Imperatives.*

To ask	... putshi.
Imp.	... putshi.
„ buy	... qre (?)
Imp.	... dedjen qréas.
„ sell	... brínkrêk.
Imp.	... brínkres, brínn kíràs.
„ run	... adhèh.
Imp.	... adhiài.
„ sew	... sisîk (tshén
Imp.	... sî.
„ be silent	... hunk né kárik.

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Imp.	... hunk né kári.
To sleep	... prasúik.
Imp.	... prasúí.
„ strike	... gundí grí láik.
Imp.	... gundí grí lái.
„ bring	... ónik.
Imp.	... óni.
„ take away	... hárik.
Imp.	... hári.
„ tear	... udhálik.
Imp.	... udhalí.
„ give	... dék.
Imp.	... dé.
„ tell	... móndek.
Imp.	... mónde.
„ test	... djagawálek.
„ read.	... mondé=speak.

(*c.*) *Conjugations.*

TO BE

PRESENT.	
I am	... a him.
Thou art	... tù hà.*
He is	... assa hà.†
She is	... do.
We are	... abi hik.
You are	... tù tshikk hiss. = you all are.
They are, m. and f.	... ?

There is no special form for the Feminine in the Kalásha language.

IMPERFECT.	
I was	... ásis (the personal pronouns are generally omitted.)
Thou wast	... ási.
He was	... áso.
She was	... do.
We were	... ásimi.
You were	... ásíli.
They were, m. and f.	... ásini.
FUTURE.	... (probably the present?)

* Is he = è ? asan ? is there ? (at end of sentence). If thou art = tu asas (*vide* Dialogues).

† "Shiu" is also used for "is" (*vide* Dialogues.)

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TO BRING ... ONIK.

Bring thou	... óni.
PRESENT.	
I bring	... a onim.
Thou bringest	... tu óni
He brings	... asso óneu.
We bring	... abi ónik.
You bring	... tus tshikk óna
They bring	... eledrùs onea.
IMPERFECT.	
I brought	... a ónis.
Thou broughtest	... tu óni.
He or she brought	... asso óneu.
We brought	... abi ónimi.
You brought	... tus tshikk ónili.
They brought	... eledrús ónini.
PLUPERFECT.	
I had brought	... a ónim dáy. (I was bringing ?) The "onim" alone is inflected as in the present. The "day" is not changed.

FUTURE.—The present is used for the future.

IMPERATIVE.	
Bring thou	... óni.
Bring you	... ôno.
POTENTIAL.	
I will be able to bring	... a bhàm onik.
PROHIBITIVE.	
Bring not	... mô óni.
IMPOTENTIAL PRESENT.	
I am not able to bring	... a né bhàm ónik.
Thou art not able to bring	... tu nè bhàs ónik.
He is " "	... asse nè bhá ónik.
We are " "	... abi nè bháik onik.
You " " "	... tus tshikk ne bháá ónik.
They " " "	... eledrùs ne bháen ònik.
IMPOTENTIAL IMPERFECT.	
I was not able to bring	... a né bháis ónik, &c. conjugate "bháis" ónis."
I will not bring	... a ne onim.

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TO GIVE ... DEK.

Give thou	... dè.
„ ye	... déo ?

PRESENT AND FUTURE.

I give	... a dèm.
Thou give	... tu dè.
He „	... asse dáli.
We „	... abi* det.
You „	... tussi tshikk dè
They „	... eledrùs tshikk dányi.

IMPERFECT.

I gave, &c., &c.	... a pajómis, tu prá, asse práu, abi prómmi, tussi tshikk práli, eledrús tshikk prommi.
Give thou	... dè.
Do not give	... mò dé
Give ye	... déo ?
I will give	... (like the present.)
I will be able to give	... a bhàm dèk (vide this form under "to bring.")
I am about to give	... a dèm dáy, &c., (or "I have given."?)
I had given	... a pajòmis dáy, &c.

TO COME ... IK.

PRESENT AND FUTURE.

I come	... a im.
Thou „	... tu ì.
He „	... asse íu.
We „	... abi ik.
You „	... tu tshikk éu.
They „	... eledrús in.

IMPERFECT.

I came	... a á.
Thou „	... tú i (á ?)
He „	... asse áu.
We „	... abi ômi.
You „	... tu tshikk áli.
They „	... eledrús (drùs?) ôn.
I am about to come	... a im dáy=I was coming.
I had come	... a á dáy, &c.

* "Abi" seems doubtful, My informant said "abi dek=we give" and also "abi det=you give."

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I will be able to come ... a bhâm ik, &c.
Come ... í.
Come not ... mô è.

TO SEE ... DJAGAIK.

See thou ... djagái.

PRESENT AND FUTURE.

I see ... a djagèm.
Thou see ... tu djagái.
He „ ... asse djagái, (or djagalday?)
We „ ... abi djagèk.
You „ ... tu tshikk djagài.
They „ ... eledrús djagàn.

IMPERFECT.

I saw ... a djagès.
Thou saw ... tu djagai.
He „ ... asse djagalday.
We „ ... abi djagémi.
You „ ... tu tshikk djageli (tuesta djagai.)
They „ ... eledrús djagàn.

TO DRINK ... PIK.

Drink thou ... pì.
Do not drink ... mô pì.
I DRINK ... pìm.
thou „ ... pì.
He „ ... pìu.
We „ ... pìk.
You „ ... pìi.
They „ ... pin.

I DRANK ... áwis. ?
Thou „ ... áwi.
He „ ... áwia.
We „ ... áwimi.
You „ ... awi.
They „ ... aun.

TO SPEAK ... MON DEK.

Speak thou ... môn dé.
I speak ... a mòn dem, &c., &c., is conjugated like "a dem," *vide* "dêk".

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TO GO ... PARIK.

Go thou	... pári.
I GO OR WILL GO	... a parìm.
Thou „	... tu pári.
He „	... asse páreu.
We „	... abì parìk.
You „	... tuaste pári.
They „	... eledrùs paròn (will you go ?=tu parìss ?)
I WENT	... a pará.
Thou „	... tu pará.
He „	... asse parán (also "se paráu.")
We „	... abi parómi.
You	... tuaste paràli.
They „	... eledrùs paròn.

TO SIT ... NISIK.

Sit thou	... nìsì.
I sit	... a nisìm.
I sat	... a nisà.
I will sit	... like the present.

TO HEAR ... KRON KARIK *lit.*=to do ears.

Hear thou	... krón kári.
Do not hear	... krón mò kári.

PRESENT OR FUTURE.

I hear	... a sangáam, or kròn kárem.

Conjugate each as follows;

I hear	... a kròn kárem *or* sangáam.
Thou „	... tu „ kàre *or* sangáas.
He „	... re „ kàreu *or* sangáu.
We „	... abi „ kárek *or* sangáa.
You „	... tuaste „ kára *or* sangá.
They „	... eledrus „ káren *or* sangáan.

IMPERFECT.

I heard	... a sangáyes.
Thou „	... the sangáyes.
He „	... se sangáu.
We „	... abi sangaimi.
You „	... tuaste sangáili.
They „	... eledrus sangâini.

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TO STAND ... TSHISHTIK.

Stand thou	... tshishti.
I stand	... a tshishtim.
	... tu tshishti.
	... se tshishteu.
	... abi tshishtik.
	... tuaste tshishti (tshishta ?)
	... eledrùs tshishten.
I stood	... a atshishtis.
	... tu atshishti.
	... se atshishto, atshishteu.
	... abi atshishtimi.
„	... tuaste atshishti.
„	... eledrús atshishtani.

Note: compare the present or future "tshishtim" with "onim" except second personal plural.

The imperfect "atshishtis" is like "onis" except 3rd person singular "atshishto;" 2nd person plural "atshishti" and 3rd person plural "atshistani."

TO EAT ... JUK.

Eat thou	... jù.
I eat	... a jùm.
	... tu jùi.
	... se jús.
	... abi juk.
	... tuaste júa.
	... eledrús jún.
I ate	... a ashis.
	... tu ashi.
	... se ashu.
	... abi ashimi.
	... tus tshikk ashili.
	... eledrus ashin.

8.—DECLENSIONS.

A KING.	... shá
With a king	... shá-som
Of a king	... sháas.
To a king	... shaas.
A king	... shá.
From a king	... sháas-pi.
KINGS	... like the singular
A HAND	... hàst; bazá.
With a hand	... hàst-grí.
Of a „	... hàstani.

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To a hand	... hastonà mûtsha.
A hand	... bazà.
In a hand	... bazonà
HANDS	... like the singular
GOLD	... súnra.
With gold	... sunra som
By gold	... sunra grí.
PRINCE	... sháas putr.
PRINCESS	... sháas tshû.
QUEEN	... sháas djàs.
A MAN	... mótsh.
With a man	... motshe somma.
Of a „	... motshes.
To a „	... motshes.
From a „	... motshes-pi.
In man	... motshes udriman.
A WOMAN	... strija.
With a woman	... strija somm.
Of a „	... strijáas.
To a „	... „
A SON	... putr.
With a son	... putr somm.
Of a son	... putras*
A BOY	... tzàtak sudá
Of a boy	... „ sudáas (notice that the adjective does not change.)
A DAUGHTER	... tshû.
Of a „	... tshúlos / tshúas.
To a „	... tshúas.
A STONE	... bàtt.
Of „	... bàttan or bàtt gri.
FLOWER	... pûsh.
Flowery	... pushîkani as shulàani=wooden from shûla=wood. However "ug"=water has a genitive "ugàni."

* The son of the father=pútras dadas.
The father of the son=dádas pútras.
Notice that *both* nouns are in the oblique case.

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9.—Dialogues.

English.	Kalasha.
I want to learn your language	... *Táy mondr a gátim dáy.* Thy speech I (to) learn have.
If you are ill, I will give you medicine,	*Tu zabún ti asas táy wezì kárem.* Thou ill if art thy cure I will do.
Get all the things ready	... *Tshikk mál eg awata kroái.* All property one place get (?)
Are you ready to go ?	... *Tú parìss, ä né ?* Thou wilt go ? or not.
Put your clothes on	... *Tshéu sambies.* Clothes put on.
I want to learn Kalásha	... *Máy Kalásha mondr djanáy.* To me Kalásha speech to know (?) *ghattudey* = is necessary (?)
You are my friend	... *Tú máy dári.* Thou my friend.
Wherever you meet an enemy kill him	... *Dushmàn kawágalle páshìk, hróy.* Enemy wherever to meet kill.
Get up, the daylight has appeared	... *Ushti, lujáu.* Get up, the daylight has appeared (it has become light).
A very pretty woman	... *bó prusht murávek.* Very good woman.
It is not proper to say such words	... *Shâta mondr né dék osha.* Bad words not to give proper.
You ought to go to-day	... *Tay òndja parik, prùsht.* To thee to-day to go, [is] good.
Get the gun ready	... *Tupèk udjái.* Gun prepare.
Sing, dance	... *Qròn dyè, nàt kâre.* Song give, dance make ?
What is your name ?	... *táy nómm kîa ?* thy name what (?)
Whence do you come ?	... tú kawelo à ?
When do go ?	... tú kawèy parizdéy ?
Why did you come ?	... tú kóne à ?
What do you want ?	... tú kîa gates ?
I am very hungry	... a bò anóra.
Are you thirsty ?	... tú dáhán háwe.
Prepare food	... áu kári.
Is your home near ?	... téy dèsh túdaka shîu ?
Is the road far ?	... pònn déshu ?

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Yes, it is far	... Háu, (?) désho shîu.
No, it is near	... nè, tádaka.
Bring me to eat and drink	... máy hátia óni, jùm.
Bring water	... úg óni.
Sit here	... ayá nisì.
Light the wood	... shulà badzái.
Light the candle (?)	... lùtsh upuwáy.
Blow out „ „	... „ phaláy.
Stand there	... alai-kézi tshishti.
Come quickly	... Kashàp í.
Go slowly	... briàsh pári.
Put the saddle on the horse	... *hùshis hunn* dè. to the horse saddle give.
Tie the cow to the tree	... *gá múto sòmm bòni.* cow tree with bind.
How many sheep and goats have you ?	... tay kimòn ásan amréa páy ?
I want nothing	... híshki ne gátem.
Is he your brother ?	... assá táy báy è ?
This load is not heavy ; lift it	... assa phàr ugúrako nè ; upraí.
Take care	... ánde alái djagái.
Is the road good or bad ?	... pònn prúshte ; khàtsha ?
Is the mountain high ?	... sònn hûtala ä past ?
Is there a bridge over the river ?	... gau súe shíu ä nè ?
Bring ropes quickly	... radjùk kashàp óni.
Bring Butter, Milk, Cheese	... pratshóno, tshìr, pìnda.
Curds, meat, wine	... niú, móss, dá.
Grass, flour, fire	... káss, átt, angár.
Fruit	... mewá.
Smoke tobacco	... tamakù kashái.
Is there much sport about here ?	... aya dyagau*na* murù bó asan ?
If you will do great service, I will give you many presents	... may hátia prùsh kròmm kari, tày saripá dèm.
I am very hot	... may bó húllik karu day.
I am very cold ; put clothes over me,	may tramóna karu day ; tshéo dé.
Are you well ?	... prushte ásia ?
It will rain to-day ?	... óndje báshik diyáli.
It is very dark, where am I to go ?	... bó tramashùng háo ; kenti parìm.
Call the dog	... sheura, [shônra] khundiyái.
Call the Servant	... sháderr tshéyn.
May God keep you well	... khuda tai prusht *káreu.*
Good bye	... ishpáte.
[Kalásha salutation]	... shpáti.
[Báshgeli salutation]	... streká ésha.

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Go quickly	... adihai pári.
Tell the truth	... udjek mondr dé.
Give me water that I may drink	... ug dé, pim.
Come intside	... udrîman ì.
Go outside	... binàk pári.
Come here	... ayà ì.
Where did you go ?	... kawái paráo ?
Come now	... shóndje ì.
This is me, (day ;)	... shendje ádoo.
When did you buy it ? *	... kai ómi.
Who are you ?	... kûro tû ?
Which [is it ?]	... îe kura ?
Have you eaten bread	... awù áshis ?
Eat bread	... awù jù.
I am ill to-day	... á óndja bey-derkár.
My name is Malik	... mái nom Malik.
Give it to me	... mótshes dé.
Sit near me	... mái-tada nisi.
Take it from me	... maí-pígréas.
Kill me	... mai hróy.
Where is your country ?	... mímî dêsh kawáshen ?
Shut the door	... duòr kári.
To run in the heat is bad	... húluk udhéh purì (?) na.
The son of the father	... pútras dadas.
The father of the son	... dadas pútras.
Throw (with) the stone	... bàtt-grì thè.
Wooden ; of wood	... shula-grí ; shulaanì.
Made of wood	... kaíshiu.
The smell of the water is bad = watery smell is bad	... ugani bó gònd.

10.—Kalasha Proper Names.

Names of Men.	*Names of Women.*
Malik	... Danúli.
Babhàng	... Ramagúlli.
Kamàli	... Máikétshi.
Shatóng	... Tramkéti.
Batshù	... Tehitrétshi.
Sharíki	... Masár.
Tamashawèk	... Latsháí.

* Note.—The basis (pecunia) for Kalásha reckoning appears to be "ek paye" "pài" (paisa ?) = one goat. Buy=qréas. Price=qró ? (*vide* Vocabulary).

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Names of Men.	*Names of Women.*
Zinatshà	... Darimíki.
Sumál	... Nangì.
Bèkk	... Misêli.
Gasharà	... Gulifa.
Kelli	... Namakinn.
Mírak	... Wássi.
Tàsh	... Porîshi.
Tumr	... Nûr bigím.
Djoán Sha	... Sonêtshi.
Unán Békk	... Kambruetshi.
Tòrr	... Darbolí.
Mára	... Sonekí.
Alyáss	... Waz bray.
Djanekwár	... Maûki.
Mírza Bèkk	... Durdaná.
Dadúk=uncle	... Badaràk. Yamni. Donashîri. } names of celebrated beauties. Gumlí Masturá. Badulkéi.

Names of Castes.

Torikdári	...	2 high castes.
Butidári	...	
Shalekdári	...	lower castes; the last *seems* a high caste.
Bumburnaù	...	
Rajawári	...	

Names of Villages.

Mumurèt	...	Villages whose inhabitants are allowed to intermarry.
Rongmú	...	
Biriú	...	

11.—A PRAYER OF THE BASHGELI KAFIRS.

(In the Kalásha dialect)

(may serve as an exercise for translation).

The ideas and many of the words in this prayer were apparently acquired by my two Kafirs on their way through Kashmir.

Khudá, tandrusti dé
Prushkári, rozì dé.
Abattì kari.
Dewalatman.
Tu ghóna asas.
Tshik intara.

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Tshik tu faidá káy asas.
Sat asmán tl.
Stra suri mastruk mótshe dé.

12.—Appendix to Vocabulary.

Add to Verbs.

TO DO ... KARIK.

Present and future.

I do	... kárem.
	... káre.
	... káreu.
	... kárek.
	... kára.
	... káren.
Do	... kare, thí.
Do ear,=hear	... krón káres.
Do not do	... mû kári.

Add to Imperatives and Infinitives.

Put (in a place)	... kroái.
Put on (clothes)	... sambíes.
To meet	... páshlk.
It is proper	... ósha.
Prepare	... udjái.
Light (the fire)	... badzái.
„ (the candle)	... upuwáy (*vide* Dialogues)
Blow out „	... phaláy.
Lift (a load)	... uprái
Smoke (tobacco)	... kashái
To fall (rain)	... diyálik.
Call (the dog)	... khundiyái.
Call (the servant)	... tshéyn, tshln.

Miscellaneous words.

Wherever	... kawágalle.
From	... pi (*vide* declensions.)
Or	... ä (for use *vide* Dialogues.)
With	... grì (*vide* declensions.)
If	... ti (do. do.)
What	... kía ?
Who	... kúro ?
Whence	... kawelo ?
Whereto	... kenti.
When	... káwey, kái.
Where	... kawái ? kawáshen. ?

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Why	... kône.
How many	... kimòn (?)
Nothing	... híshki
Here } There }	... ánde alái.
Not	... nè.
Over	... súe
Hereabouts	... aya dyagauna (?)
Here	... adíhai (?) ayà.
Inside	... udríman.
Outside	... binàk.
Now	... shóndje.
Yes	... háu (?)

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SKETCH OF KALASHA GRAMMAR.

1.—Mode of Spelling.

The vowels are pronounced as in German or Italian, *viz.*, "a" as in father; "e" as in ever; "i" as in bit; "o" as in bonus; "u" as in put; "au" as "ou" in mouse; "ei" or "ey" is pronounced diacritically or each vowel separately; "ai" as "i" in light. When a vowel has no accent over it, it is supposed to be short; when it has a circumflex over it, it is long. The accent ′ marks the syllable in which the sound is raised and is like the French "accent aigû;" the accent ‵ gives a sharp and clipping intonation to the syllable over which it is put, not unlike the "accent grave" in French. It will be perceived that the accent is restored to its proper use, that of marking the intonation and that it is not used, as in the Hunterian system, to denote the nature or length of the sound. The Hunterian system is inapplicable to the transliteration of languages newly committed to writing, as it tends to confound true accentuation with the *nature* of the sound. Its imitators are also apt to put "a" where an "e" (pronounced as above) should be put, and even to put "a" for "u" as, for instance, "Kabal" for "Kabul" and "Massalman" for "Mussulman." English travellers should either write down the sound as in common English words or else as in German.

"Kh" is pronounced diacritically; "tsh" as "ch" in "church." Where a word is spelt in two different ways in the vocabulary, it is because the two Kafirs, from whose utterances it has been compiled, pronounced it differently. "dj" is "j" as in "jelly;" "j" as "j" in French "jour."

2.—Mode of eliciting words or grammatical forms from the two Kafirs placed at my disposal by His Highness the Maharaja of Kashmir at the instance of the Panjab Government.

I had not the same opportunities for checking the correctness of what I heard, or thought I heard, from the two Bashgeli Kafirs, which I enjoyed in compiling my vocabularies, songs and legends of the Dardu languages, as they were not long enough in my service, the heat of the Panjab compelling them to return to their, probably temporary, home in Kashmir; but the process which may be useful to other travellers, provided they are patient and sympathetic in their intercourse with the natives, is sufficiently indicated in my introduction to Dardistan, from which I quote the following:—

"Those who know how difficult it is to elicit grammatical forms from savages, or even from the half-educated in a civilized or semi-civi-

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lized community, will be able to form a conception of the almost insuperable difficulties in my way.

"It was easy enough to *point to objects* in order to learn their names and to find expressions for the *simplest bodily wants* that could be indicated *by gestures*; it was more difficult to discover the *imperative form* in the commands given by my followers, on understanding my wants, and to *trace an affirmative* or *the present or future indicative* in the replies; it required the closest attention to follow the same sound in any discussion that might have ensued in consequence.....Often, subsequently, when almost sure of a form, have I discovered that the person addressed did not understand my question or had made use in reply of an idiom or an evasion. However, by asking the same question from several people, by making them ask each other, and by carefully noting their replies, I gradually reached that approximative certainty which alone is attainable in so complicated a matter."

3.—The Definite or Indefinite Article in Kalasha.

There appears to be none in that language.

4.—The Declension of the Noun.

Most nouns appear to end in a consonant. There does not apparently exist a different termination or affix for the plural in Kalásha, which is the least inflectional of the Dardu group of languages to which it belongs. The accusative is apparently identical with the nominative. The GENITIVE or rather the oblique form, is formed by the addition of "as," more rarely "es" and "is" to the nominative, *viz*: shá=a king; sháas=of a king; putr=a son; putras=of a son (*vide* declension) mots =a man, motshes=of a man; ek=one; egis=of one;=first. *Examples of use*: the son of a king=sháas putr; the daughter of a king=sháas tshù. The same form for the genitive (if that term be applicable to it) is used for the feminine noun; *viz*, strija=a wife; strijáas=of a wife. "Tshù" a daughter appears also to have a genitive "tshúlos," as well as "tshúas." "Hast," a hand, has genitive "hastani," "ug,"=water has "ugani" the fact being that the genitive termination is really adjectival and that the "son of a king" is equivalent "to the royal son;"* at any rate, "shulá"="wood" forms its adjective by the addition of "ani" *viz*, shuláani=wooden; push=a flower has "pushakáni," flowery. The Kalásha idiom appears to require that, in instances like the above, both the nouns be inflected or put into the oblique case, *viz.*, instead of saying "putr dadas"=the son of the father or "dadas putr" the Kaláshas say "putras dadas"=the son of the father, and "dadas putras'

* As a matter of fact "sháas putr is stereotyped into Prince.
sháas tshú " " Princess.
and sháas djàs " " Queen.

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"the father of the son" (the word which, according to us, ought to be inflected, being put first).

The Dative has the same inflection as the Genitive except in "hast" =hand, whose dative appears to be expressed by the addition of "oná," hastoná (*vide* declensions).

The ablative "*from*" is expressed by the affix *pi* to the oblique form which may be compared with the old Hindui पै which also signifies *from*—

***Example*:**	shá	= a king or kings.
	shá-somm	= with a king or kings.
	sháas	= of a king „
	sháas	= to a king „
	shá	= a king „
	sháas-pi	= from a king „

There need be no great difficulty apparently in distinguishing the singular from the plural or the genitive from the dative. When the existence of more than one king is insisted on, there are the numerals or "bò"=many, to fall back upon, whilst the singular would serve for kings spoken of collectively. When two nouns come together, the first noun in the oblique case is genitive, whilst if a verb and noun come together and the noun is in the oblique case, the noun is generally in the dative.

The adjectival terminations are apparently "àni" sometimes for euphony *ikani* as; ug = water, ugani = watery; push=flower=push-ikani = flowery=or merely "an" as bátt=stone; battan = of stone; stony; pisht or pishto = after; Pishtan = the one who is after = the second *m* or "una" as "motshe" = motshuna=third or "in" as *trein*=third, from, tré=three.

5.—The Numerals.

The numerals are almost identical with those of the Prakrit idioms of India. Like the Dardu numerals, those of Kalásha and of other Kafir dialects are made up by multiplication and addition. The Kalásha numerals are inflected (if that term may be used) in all instances where "ten" is *added*, but not where they are multiplied, *viz.*:

1	ék	11	daj * *éga.*
2	dú	12	daje* *dúa.*

* In these two forms the original (palatal) "sh" is dropped (being first changed in "h") and the encliticum "je" affixed; "je" is probably the Sanskrit च *and*, still to be met with in the old Hindui. The numerals from 13 to 19 are much mutilated, the final "a" only expressing the number 10, *viz*: tré=3; trea 13. The "dash"=ten, has lost the initial "d" and the final s (sh) was changed to h (as Sindhi daha) and then dropped altogether. Nineteen=*oa*, is quite a new form) leaving the trace both of Sanskrit and Prakrit, (*Dr. Trumpp.*) These remarks are very valuable, but, as regards the elision of "dash," the fact is that thirteen is not "trea," but "dáje tréa."—*G. W. L.*

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3	trè	13 daje	trea.
4	tsháu	14 „	tshana.
5	pondj	15 „	pondja.
6	shó	16 „	shóa.
7	sàtt	17 „	satta.
8	asht	18 „	ashta.
9	nò	19 „	nóa.
10	dash	20 bishi.	

21	bishije-ek	31	bishije-daje-ega.
22	„ dú	32	„ dúa.
23	„ tré	33	„ trea.
	As from 1 to 9 without change after "bishije."		As from 11 to 19.

40 dubishi=two twenties.
50 dubishi dash=two twenties and ten.
60 tre bishi=three twenties.
70 tre bishi dash=three twenties and ten.
80 tshau bishi=four twenties (compare the French quatre-vingt for 80 and quatre-vingt-dix for 90).
90 tshau bishi dash=four twenties and ten.
100 pondj bishi=five twenties.
200 dash bishi=ten twenties, &c., &c.

(*b*).—*Ordinals.*

In the ORDINALS there appears to be a tendency to use the ordinal preceding the one that is required, with the addition of "pishto"=after; thus: First=*éyis*; second=*éyis pishto*=after the first. Third=*doim pishto*=the one after the second; fourth=*trein pishto*; fifth=*tshouin pishto*=the one after the fourth. Why "doim" should not be commonly used for second; trein for third; tshouin for fourth, I have not be able to ascertain, but as according to the genius of the language, the ordinal is probably the genitive of the cardinal, *viz.*,=ek=one; egis=of one=first, and the genitive really an adjectival form, also found in adding "ani" to the substantive, the rule requires the relative to be put in the oblique case (*vide* pútras dadas=the son of the father), and in order to do this, "pishto"=after, is usually put after the ordinal preceding the one that is required, whilst "the second" is really the "pishtan"=or the one who comes *after*. We also have "motshe" and "motshuna" for third. The "im" in "Doim" does not appear to be a Kalásha termination, but may be a mistake for "doin," in which case it would be the adjectival ending "in" or ina (?) and correspond with trein=third and tshouin=fourth The following comparison will show the different ways in which ordinals seem to be expressed:—

First=égis (from ek=one) (also shumerau ?)=of the one ?

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Second = pishtan = the (one who comes) after (from pishto = after).
dóim = the second from *dú* = two or *dúin* ?
égis pishto = the one after the first.
Third = motshe.
motshuna.
doim pishto = the one after the second.
trein = third.
Fourth = tshouin = fourth.
trein pishto = the one after the third (this seems to be the usual form).
Fifth = tshouin pishto = the one after the fourth.

I quite agree with Dr. Bellew's remark in his Lecture on the 27th ultimo that it is difficult for these races to realize numbers above ten, but as has been seen the Kafirs go much beyond that number by multiplication and addition to the number "twenty."

The Indian vernaculars offer no analogy to this, but we know from other sources, that the Sanskrit palatal "sh" is changed to "k" and "g"; for instance the Sanskrit shoan, dog, becomes in Greek and kúon the very numeral, vinshati, twenty, has been changed to viginti in Latin. There can therefore be hardly any doubt about the correctness of the form "biga" (in Gilgiti). Most curious it is, that the other tenths are made up by *multiplication* and *addition*, and that the original Sanskrit Prákrit numerals are dropped altogether. The very same phenomenon we meet with in the language of the Siah Posh Kafirs in the Hindu Kush, who are likewise sprung from the great Arian stock. We find thus bigadâi, twenty and ten = thirty; du biô (= du biha) twice twenty = forty; du biôga-dâi twice twenty and ten = fifty; tshê biô three times twenty = sixty; tshê-biogâ dâi = three times twenty and ten = seventy; tshâr biô = four times twenty = eighty; tshâr biô dâi, four times twenty and ten = ninety. We do not know how to explain this fact; for there can be no doubt that the Dardu races had originally the Sanskrit-Prakrit numerals. Why did they drop them? We can hardly fancy that they dropped them for convenience sake, for it is far more troublesome to make up for original numerals, by multiplication and addition, than to express them by one noun. But not only among the Dardu races and their brethren, the Kafirs in the Hindu Kush, we meet with this strange fact; the same phenomenon may also be observed in the decomposition of the Latin into the Gallico-French (not in Italian or Spanish) as quatre-vingt = four times twenty = eighty; quatre-vingt dix = four times twenty and ten = ninety. We see thus, that when an old language is once giving way and going to pieces (which is generally the case amongst great commotions or in times of great ignorance), essential parts of it may be lost which can no more be recovered." — *Dr. Trumpp in the "Calcutta Review," April 1872.*

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6.—The Pronouns.

(a).—The Pronouns of the 1st person.

Singular—

I=a.
Of me=máy (also "my" "mine.")
To me=mótshes (compare the oblique terminations of the noun.)
By me=mái-tada.
From me=mái-pi.
Me=mái.

Plural—

We=abì (or a tshikh=I all=we all?)
Of us=homo*
To us=hóma*
By us=homo-táda.
From us=hómo-pi.

---

* It will be noticed that the terminations of the genitive and the dative plural of the Pronoun do not correspond with those usual to the noun singular, which alone I could ascertain. It is not improbable that these endings may help us to discover a plural form to the noun, either still existing or lost. The difficulty felt by Dr. Trumpp as regards the "p." of the ablative is unintelligible to me, especially as he had so ably explained it in connexion with the noun. As, however, his review of the pronoun is extremely suggestive I quote it here. "In the Kalásha dialect we find á *f.*, an abbreviation from awâ or from the Prakrit अहअं. In the genitive singular we meet the form "mái" which serves at the same time as formative for the other cases, the dative excepted. This "mái" corresponds to the Sanskrit accusative singular, मा. In the dative we meet with the form "mótshes;" Hindi, मुझ Prákrit, मज्झ; which has been dropped in the other Dardu dialects. The instrumental singular is "mái tada," by me; and the ablative mái pí; the origin or derivation of both these postpositions is unknown to us.† The nominative plural is abi, we; very likely derived from the Prakrit अम्हे, by changing m to v=b, and dropping w; ame=ave or abé, and thence abí. In the formative plural, we find again hómó (=ham, a being changed to ó). The dative plural is stated to be hóma, which must be left doubtful, as we cannot sufficiently elicit, from the few examples given, the formation of the dative in Kalásha.

† Pí might be compared with the old Hindúí पै which signifies not only *upon*= but also *from*. So says, for instance, Nám Dév मो पै जबाब नहोइ=from me no answer is made.

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(b).—The second persons of the Pronoun.

Singular—

Thou=hómo ? tu.
Of thee=tái=thy, thine.
To „ =tái.
By „ =tái-táda.
From thee=tái-pì.

Plural—

You=abs tshikk=you all (*vide* "a tshikk"=we all).
Of you=mîme.
To „ =mîmi.
By „ =mimi-tada.
From you=mimi-pi.

Compare "abs" with "bisa" for "we" in Arnyiá, the language of Chitral.

The curious form "abs" is compared by Dr. Trumpp with "Sindhí tavhẽñ and tahẽn, also the form avhẽñ, which apparently goes back to the pronominal base *vas* (vasm) with euphonic initial a=avhiñ. Quite in the same way the Kalásha "abs" is formed. In the formative plural we meet with *mîmi*. The only apparent explanation is that the initial "m" is a change for v, so that mîmi would stand for vimi. This brings us to forms like the Greek *'υμεῖς, 'υμμες* (Ionian), which are derived from the Sanskrit base युष्म (=yu-shm)." I think that "abs" is a misprint for "abi," but I have not my original notes with me here in order to check this word. There is no doubt that "abi" too is doubtful, for my informant said "abi dek=we give" and "abi det=you give" instead of "abi det" and "tussi tshikk de" of the paradigm. It therefore seems possible that abi tshikk and eledins may be merely words denoting number, as "tshikk"=all certainly does.

(c).—The Demonstrative Pronouns.

Kalásha seems to have no personal pronoun for the third person, as little as the Sanskrit-Prakrit and the modern idioms derived from them; the *demonstrative* pronoun is used instead.

Singular—

ásá=he, this.
ásá=of him.
ásá-tada=by him, near him.
ásа-pi=from him.

Plural—

sheli=they.
ísi=of them.
asi, shási } =to them.

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shási-tada=by them.

shási-pl=from them (for the feminine *vide* Vocabulary.)

On this Dr. Trumpp remarks:—

"In the Kalásha dialect the base "âsâ" is given, which remains as it seems, unchanged in the genitive singular and in the formative. The nominative plural shêli (com) looks very curious. In the plural genitive we find îsi, and in the formative âsi=shâsi. Asâ we would identify with the Sanskrit demonstrative pronoun असौ=that, though the plural shêli remains for the present a riddle, which we have no means to solve."

7.—The Verb.

The verb, as indeed the Kalásha language generally, offers more striking resemblances with Gilgití, the most developed of the Dardu languages, than with the nearer Arnyiá, the language of Chitrál. The infinitive generally adds a "k" to the root, which I presume is the imperative, *viz.*, kári=do; karik=to do. Oni=bring; onik=to bring; jù=eat; juk=to eat; dé=give; dek=to give. Imperatives in "es" elide the "s" and add "k" as above, *viz.*, brínkres=sell, brinkrék =to sell. It seems to me that Kalásha is a Dardu language in a state of deterioration, but that it nevertheless has preserved some forms which are more ancient than those used in the modern vernaculars of India. What I have been able to elicit regarding the conjugation of the verb will be found in the Vocabulary, but it only serves to overcome the first difficulties of an enquirer, and may, it is hoped, be a starting point for further discoveries of forms and for the correction of what is herein contributed. The verb of existence offers, as usual, more than the ordinary difficulties of conjugation, whilst a few other verbs, in most common use, have their various tenses derived from different roots. Again, there does not seem to be a distinctive form for the future tense, for which the present appears to be used. Nor are the 3rd persons masculine and feminine differently inflected, a circumstance which is in striking contrast with Gilgiti, in which even the masculine and feminine of the 1st and 2nd persons, as well as distance, are indicated by different terminations. On the other hand, the Gilgiti future "bom" which is also used for "to be able" may explain the Kalásha "bham" which added to the infinitive means "I will be able" (*vide* conjugations). The changes of accents in the various tenses and parts of tenses are generally remarkable, but would lead us beyond the range of this very rough sketch. In the following sketch of conjugations, the personal pronouns are omitted, as they

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are not indispensable and as their omission may serve to show the inflections more pointedly:

	Be.	*Bring.*	*Give.*	*Come.*	*See.*
PRESENT:					
S. 1st person,	him,	ónim,	dèm,	im,	djagèm.
2nd „	hà,	óni,	dè,	ì,	djagái.
3rd „	hà,	oneu,	dáli,	íu,	djagái (djagal-day?)
P. 1st „	hik,	onik,	det,	ik,	djagèk.
2nd „	his,	ona,	dè,	éu,	djagái.
3rd „	hin, (?)	onen,	danyi,	in,	djagàn, djagáu?
IMPERFECT:	ásis,	onis,	pajomis,	á,	djagès.
	ási,	oni,	prá,	i [á ?]	djagai.
	áso,	óneu,	práu,	áu,	djagalday.
	ásimi,	onimi,	prommi,	ómi,	djagémi.
	ásili,	onili,	práli,	âli,	djageli, djagai?
	ásini,	onini,	prommi,	ôn,	djagàn.
INFINITIVE:	?	ónik,	dêk,	ìk,	djagáik.
Imperative *S.*	?	óni,	dè,	ì,	djagái.
Do. *Pl.*	?	óno,	déo ?	?	
Prohibitive—	?	mô óni,	mô dê,	mô é.	
Special forms	?				
I will be	?	like present.			
I will be able [in a state to] ?	...	bhàm onik,	bhàm dêk,	bham ik.	
Thou ditto	...	bhàs onik.			
He ditto	...	bhá onik.			
We ditto	...	bháik onik.			
You ditto	...	bháá onik.			
They ditto	...	bháen onik.			
I was able...	bhais	...	...	bhais ik.	
	bhai.				
	bhaeu.				
	bhaimi.				
	bhaili.				
	bhaini.				
I am about to give or I have given ?		...	dèm dáy.	ìm day?	
I had given ?		...	pajomis dáy.	á day ?	

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PRESENT OF :

Drink.	*Go.*	*Sit.*	*Do.*	*Hear.*	*Eat.*	*Stand.*
Pim,	parìm,	nisìm,	kárem,	kròn kárem, or sangáam,	jum,	tshishtim.
Pì,	pári.	nísi,	káre,	sangáas,	jus,	tshishti.
Piu,	páreu,	níseu,	kareu,	sangáu,	jui,	tshishteu.
Pik,	parìk,	nisìk,	kárek,	sangáa,	juk,	tshishtik.
Pii,	pári,	nìsi,	kára,	sangá,	júa,	tshishti (a ?).
Pin,	paròn,	nisòn (?)	karen,	sangáan,	jún,	tshishteu.

IMPERFECT :

Awis,	pará,	nisà,	...	sangáyes,	ashis,	atshishtis.
Awi,	pará,	nisá,	...	sangáyes,	ashi,	atshishti.
Awia,	paràu,	nisàn,	...	sangáu,	ashu,	atshishteu.
Awimi,	parómí,	nisómi,	...	sangáimi,	ashimi,	atshishtimi.
Awi,	paràli,	nisàli,	...	sangáili,	ashili,	atshishti.
Aun,	paròn,	nisòn, (?)	...	sangaini,	ashin,	atshishtini.

INFINITIVE :

Pik,	parík,	nisìk,	...	...	jùk,	tshishtik.

IMPERATIVE :

Pì,	Pári,	nisì,	...	...	jù,	tshishti.

PROHIBITIVE.

Mô pi,	...	mô nisi,	...	...	mô jù, mo tshishti.

The prefix of "a" to tshishtik=to stand, in the imperfect, almost challenges comparison with the imperfect "awis" from pîk=to drink; the imperfect "ashis" from "juk=to eat" and the significant imperfect ásis=I was, imperfects evidently belonging to different roots, whereas "atshishtis" comes obviously from tshishtik and the remnant of an obsolete form.

8.—COMPARISON OF KALASHA WITH GILGITI AND ARNYIA (THE LANGUAGE OF CHITRAL.)

That Kalásha should in some respects resemble Arnyiá is not extraordinary, but that it should offer many more resemblances with Gilgití, not only in words but also in inflections is very remarkable. We will notice a few of the resemblances.

In *Nouns*. That the names of animals, names representing sounds and some metals should resemble one another both in Arnyiá and in Kalásha is only natural, *viz.*, ass=gordók in A. and gordók in K. ant=pililí in A. pililik in K; (also pililí in Gilgití). Bear=ortz in A, itz in K. itsh in G; "gun" is expressed in all by a variation of topék, "iron" of "tshimr," but the following table will show the closer proximity of Gilgití to Kalásha than may be supposed.

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English.	*Gilgiti.*	*Arnyiá.*	*Kalásha.*	*Remarks.*
Bone	âti	kêl	atì.	
Brass	rìl	rel	harila.	
Coward	bigatur	burtuàk	biheuder.	
Cat	bûshi	khaláo	púshak.	
Cotton	kayás	didôno	krawas.	
Cow	gâo	leshu	gak.	
Crow	ká	kâgh	kagra	evidently onomatopoetic.
Dog	shú	réni	sheon.	
Ear	konn	karr	koron.	
Eye	atshí	ghétsh	ètsh.	
Earth	summ	bùm	tshòmm.	
Finger	agui	tóhumót	ango.	
Father	bábo (in exclamation.)	tàt	wáwa.	
Fire	agár	angàr	angar.	
Fort	kot	kott	kòtt.	
Gold	sonn	sórum	sóa.	
Head	shìsh	sórr	shish.	
Horse	ashp	istòrr	hashsh.	
Heart	hío	hardì	héra.	
Husband	baráu	mosh	berù.	
Month	mátz	mas	mastruk.	
Mother	ádje (as an exclamation)	nann	aya.	
Milk	dùtt	tshirr	tshìrr.	
Nose	náto	naskárr	nátshor.	
Oil	teyl	tell	teue.	
Ring	anguélo (in Astorí)	pulungusht	angúshter.	
Silver	rup	drochm (very significant.)	rúa.	
Son	pùtsh	djáo	putr.	
Star	táro	istari	taro.	
Stone	batt	bórt	batt.	
Tongue	jìpp	liyínni	djìpp.	
Water	wéy	úk	ùg.	
„ ford	weygá		wazái. / ùguni.	
Right	datshíni	tori	drántsho.	
1	eyk	í	ek.	
2	do	djù	dú.	
3	tré	tróy	tré.	
4	tshar	tshôr	tsháu.	

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English.	*Gilgiti.*	*Arnyiá.*	*Kalásha.*	*Remarks.*
5	poñ	poñtsh	pondj.	
6	shá	tshoi	shó.	
7	sath	sòt	sàtt.	
8	átsh	osht	asht.	
9	nau	ñò	nò.	
10	day	djōsh	dash.	
Twenty	bí	bishír	bishi.	
21	bi-ga-ek	bishirotshei,	bisheje-ek.	
Long	jügo	arung	drîga.	
Deep	gutúmo	qulùm	gùtt.	
Bad	kátsho	shumm	khátsha.	
Heavy	agúro	kaì	agúroka.	
High	utálo	drung	hútala.	
Sweet	móro	shirìn	máhora.	
Sour	tshúrko	bóshut	tshúkra.	
Black	kino	shá	krìlna.	
Between	majja	mujja	mosthe.	
Behind	pattu	âtshi	pishto.	
I	má	awwá	a.	
Of me	méyo	ma	mai.	
To me	mate	mate	motshes.	
By me	makatsh	manáse	mai tada.	
From me	madjò	ma sàrr	máí pi.	
We	bé	ispá	abí.	
Of us	asséy	tshikkán	hómo.	
Thou	tù	tu	tu.	
Of thee	téy	tá	tái.	
You	tzó	bisa	abs.	
Of you	tzai	bisa	mîme.	
He	ró	he	àsa.	
Of him	résey	háto	àsá.	
They	aní	hamí	shéli.	
Of them	aniney	homitan	asi.	
See	tshaké	lolé	djagái.	
Sit	béy	nishi-ùr	njsì.	
Cut	tshìnn	tshimé	tshînni.	
Drink	pì	payé	pì.	
Weep	ró	kelé	tróy.	
Get up	uthó	ruphé	ùshti.	

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English.	*Gilgiti.*	*Arnyiá.*	*Kalásha.*	*Remarks.*
I am ...	ma hanùs ...	asùm ...	a him.	
	tu hanó ...	asùs ...	tu há.	
	ro hanù ...	asùr ...	asso há,	
	be hanòs ...	asúsi ...	abi hik.	
	tzo harètt ...	asúmi ...	tu tshekh his.	
	ri hanné ...	asúni ...	eledrus hìn.	
I was ...	asuss ...	mo oshôi ...	asis	
	asó ...	tu oshô ...	ási	
	asù ...	hes oshói ...	aso	
	asìs ...	hai asìstai	ásimi	
	assièt ...	isp atshikk o-shostam ...	asili	
	asé ...	het asistani	ásini	
I will be, ...	bòm ...	bòm ...	bhàm	
	bé ...	bós ...	bhàs	
	béy ...	bóy ...	bhà	
	bóu ...	bôsi ...	bháik	
	bât ...	bômi ...	bhái	
	bên ...	bôni ...	bháen	
To BRING,	arôki ...	angîko ...	ônik ...	The presence of the "k" in the infinitive in the three languages, instead of the usual Prakrit forms, is very striking. On this subject the remarks by Dr Trumpp, which are appended to this Sketch, may be read with interest. The similarity of the inflections in the present 1st and 3rd persons singular and 3rd person plural in the three languages is also remarkable.
Bring thou,	aré ...	angé ...	óni ...	
I bring ...	mas arèm ...	angòm ...	onim ...	
Thou „ ...	tus aré ...	angòs ...	oni ...	
He „ ...	ros aréy ...	angóy ...	óneu ...	
We „ ...	bés arôn ...	angósi ...	onik ...	
You „ ...	tzòs areát ...	angómi ...	óna ...	
They „ ...	rís arén ...	angóni ...	onen ...	
I brought,	mas arégas,	ganistam ...	ónis ...	
	tus arégа ...	ganísta ...	óni ...	
	ros arégu ...	ganístai ...	óneu ...	
	bès aréyes ...	ganistam ...	onimi ...	
	tzós aréyet ...	ganistami ...	ónili ...	
	ris aréye ...	ganistani ...	onini ...	
A king ...	rá ...	mitèr ...	shá ...	Instances of similarity between these languages and especially between Gilgiti and Kalá'a may be multiplied, whilst equally numerous examples of differences may be given, but no doubt exists in my mind that this Káfir language, at all events,
With a king	ra-sáti ...		shá-som ...	
Of „ „ ...	ráe ...	mitáru ...	sháas ...	
To „ „ ...	rat ...	mitarute ...	sháas ...	
A king ...	ra ...	mitaru ...	shá ...	
From a king ...	ra-djò ...	mitarôsar ...	shaas pi ...	
In a king...	rá madjá ...	mitar tâu ...	shaas udriman ? ...	

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English.	*Gilgiti.*	*Arnyiá.*	*Kalásha.*	*Remarks.*
Gold ...	sònn ...	sórum ...	sunra ...	belongs to the Dardu group. In Arnyiá as in Kalásha the tenses of the verb are in many cases derived from different, though synonymous, roots (*vide* conjugations). The verb can be conjugated in both languages with or without the pronoun. In both languages the present may be used for the future.
With gold,	sónne-sáti ...	...	sunra-som...	
Of gold ...	soné́y ...	sormo ...	sunrà-gri ...	
To gold ...	soné́te ...	sormóte ...	(by gold, golden as battan or battgri=by stone or of stone=stony ?)	
Gold ...	sonn ...	sormo ...		
From gold,	sonnedjò ...	sormosàr ...		

"*The Verb.*

The Dardu verb is full of interest, as we meet with many forms of which we cannot find a trace in the cognate idioms. We can see at the first glance, that the conjugation of the Dardu verb is richer in form, than most of its sister-dialects in the plains of India, though the grand features of the conjugational process are the same....In the following lines we shall try to give a general survey of the conjugational process, in which many old forms, which are lost in Hindí, have been preserved.

The Infinitive.

In *Ghilghiti* the *Infinitive* ends apparently in óki, for all verbs given in the list, whatever their final root-vowel may be, have the termination óki, as aroki, to bring (root ar) ; tshakoki, to see (root tshak). This termination is very puzzling. We know that the old Sanskrit infinitive termination *tum* has been lost in all the Prákrit idioms (and for the greatest part already in Prákrit itself), and that the *verbal noun* ending in *ana* has been substituted for it ; so we find in Hindí ná, Sindhí, anu, Maráthí anéñ, *etc.*; even in Pushtó the infinitive ends in al=ana. We see that the *Astóri* quite agrees with this formation of the infinitive, for we find there instead of aroki the form areóno ; instead of tshakoki, tshakeono. The *Arnyiá* and Kalásha dialects seem to point on the other hand to the same form ; for we find in Arnyiá for the Ghilghití aróki, angíko ; and in Kalásha, onik. The terminations-oki, íkó and ik are apparently only variations of the same affix. But what is this affix likely to be? We find in Sindhí and in the old Hinduí the affix ká, feminine kí (=Sansk. ुक) used in a similar way ; as, Sindhí लुछ्ण, to be tossed about ; लुछिको the being tossed about ; old Hinduí, छुटिको s. f., deliverance, from छुटना. The affix ुक forms originally adjectives ; and लुछिको, *etc.*, signifies therefore (as a *secondary* theme derived from लुछन) *that which tosses about** and (as an *abstract* noun) *the tossing about*. The Infinitive as a verbal noun is therefore not the root of the verb ; this must be looked for in the *imperative.*"

* That forms like tshakoki are to be taken as *verbal nouns* may be seen from the phrase, pioki káro (p. 31,) *for the sake of drinking.*

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DESCRIPTION OF THE ILLUSTRATIONS.

1. The two Kalásha-speaking Kafirs, Málek and Bátshu, referred to on pages 144 and 145 are at the right-hand corner in the Photographic Group comparing them with some Dards from Chilás, an Astóri and a Little-Tibetan. They have also been reproduced in a, not very successful, drawing, and are described as having been in my service in April 1876. The year should be 1867.

2. Jamshêd of Katár, the nephew of General Feramorz, the renowned Kafir General in the service of the late Amir Sher Alí of Kabul. Jamshêd was a confidential orderly both in the service of the Amir Sher Alí and in that of Yakúb Khan, whose cause he espoused against that of his father, in consequence of which, when his master was imprisoned, he fled to Rawalpindi where he came to me. He had witnessed some of the most exciting scenes in modern Kabul history, had risen to the rank of Major and had served with Prince Iskandar of Herát, whom he, afterwards again met in London and who, rather unaccountably, is, apparently, playing no part in connexion with present Kabul affairs.

In 1872 I published from Jamshêd's dictation, an account of the "Adventures of Jamshêd, a Siah Posh Kafir, and his wanderings with Amir Sher Alí" and also "a statement about slavery in Kabul, &c," which contained the names of places and tribes, previously unknown to Geographers and Ethnographers, as well as historical and political material, the value of which has been proved by recent events. I took him with me to England, not only on account of the interest which exists in certain scientific quarters as regards the "mysterious race" of which he was a member, but also in order to draw the attention of the Anti-slavery Society and of Government to the kidnapping of Kafirs—the supposed "poor relations" of the European—which is carried on by the Afgháns.

His measurement was taken, according to the systems of both Broca and Schwartz (of the Novara expedition) by Dr. Beddoe and the type appeared to approach nearest to that of the slavonized Macedonians of the Herzegovina, like one of whose inhabitants he looked, thus creating far less attention, especially when dressed *á l' européenne* in Europe, than he did at Lahore, where Lord Northbrook saw him. The Anti-slavery Society sent him to the Chiefs of Katár with a communication to the effect that Englishmen strongly disapproved of slavery and that they should represent their case to the Panjab Government. A curious incident in connexion with his presence in England may be mentioned. It was the 6th May 1874, the day of the "Two thousand"; the result of the Newmarket race was eagerly expected, when the "Globe" came out with the following titles placed on the posters: "Result of the Two thousand." "An interesting race" (the latter was an article on the race of the Siah Posh Kafirs.) The result may be imagined. Hundreds of Welchers plunged

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JAMSHED, THE SIAH POSH KAFIR

(From Katar.)

Brought to England by Professor Leitner.

FROM A WOODCUT.

PHOTOZINCOGRAPHED AT THE SURVEYOR GENERAL'S OFFICE, CALCUTTA, DECEMBER 1879.

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into an account of the Siah Posh Kafirs under the notion that they were going to have a great treat in a telegraphic description of a Newmarket race. I was informed that the wrath of the sporting roughs, who besieged the office, was awful, when they found out their mistake. Poor Jamshêd was seen across the Panjab border by one of my Munshis, but returned some months later to Lahore, whence he found his way to Brussa, in Asia Minor. It is supposed that he took service in the Turkish Army, but he has not since been heard of. As I intend to publish an account of the Kafirs of Katár (now, I fear, all Nimchas, or half-Muhammadans) Gambir, &c., I reserve the interesting statements of Jamshêd to another Section on "Káfiristán."

3. The drawing of a Kafir, dressed in goat-skin and with a dagger in his hand, is from a Photograph which was kindly presented to me by Mr. Briggs, the Missionary of Peshawar. This Kafir possibly accompanied Gára, whom Dr. Bellew mentioned on the 27th ultimo, and may belong to the same village of Shaiderlám. For an interesting account of Gára and of the tribe to which they belong *vide* Church Missionary Intelligencer for July 1865.

4. The drawing of the seated pilgrim holding a staff is that of a Gilgiti wearing the usual Dardu cap, alluded to in this Sketch. It is merely inserted to show the variations of the Dardu type to which I believe the Bashgeli Kafirs at all events to belong.

5 & 6. The Sketch Map of Dardistán, including Káfiristán and adjoining countries, embodies a portion of the information which I collected between 1866 and 1872. It may be compared with the extract, referring to Káfiristán, from the official service Map which has just been published.

The remaining rough material, requiring elaboration, to which reference is made on page 144 consists of the following:—

1.—The Khajuná language with an enquiry into its prehistoric remnants and an account of the people of Hunza and Nagyr.

2.—Survey of the languages and races inhabiting to so-called "Neutral Zone."

3.—Badakhshán—its recent history.

4.—Travels of a Kashmír Emissary in Central Asia in 1866—(translated).

5.—Descriptive detailed Itinerary of a native Surveyor between Peshawar and the Oxus, with an elaborate Map—(translated.)

6.—Routes in various directions, with occasional details regarding the inhabitants and their Chiefs, throughout the Neutral Zone.

7.—Vocabulary, Dialogues and Account of Lughmán and Daranúr.

8.—Comparative Vocabularies and Grammar of the Chitráli [Arnyiá]

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Gilgiti, Chilási and other languages of Dardistán proper with the dialects of Káfiristán and with Kashmírí.

9.—Kashmírí Grammar, Songs and Literature.

10.—Material regarding the people and dialects of Káfiristán five sections—(one now published.)

11.—The dialect of Kandiá and other additions to the Shi portion of "Dardistán," its songs and legends.

12.—Hayward's work and death.

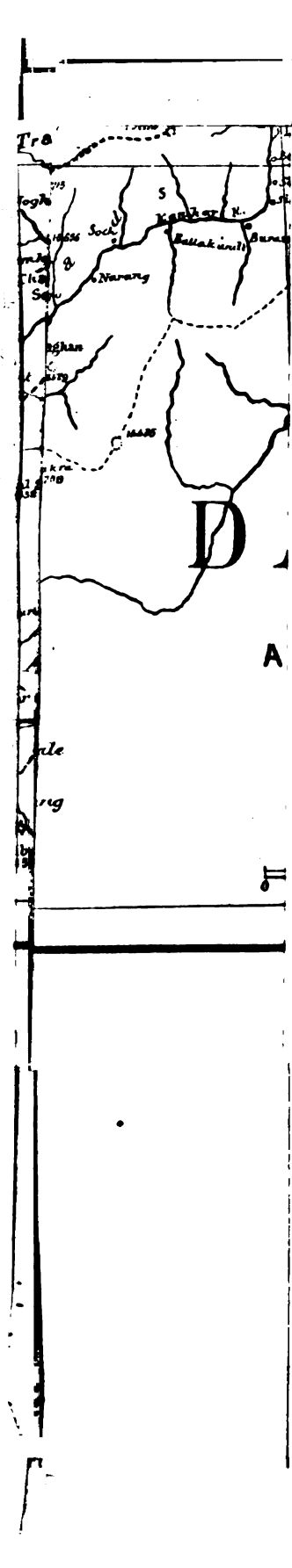
13.—The dialects or argots of the Criminal Tribes in the Pan and Afghanistán; the trade-dialects in the Panjab and Ka mír; systems of secret writing in use in the Panjab, Kashm and Kabul; the dialects of the Changars, Samés and ot tribes in the Panjab.

For other material *vide* last Edition of Dardistán, Part III, p 107.

NOTE.—Dr. Bellew's Káfir, who could not get beyond the num ten, gave "kain" for "ear" "achch" for "eye," "nós" for "no These words are too few to give an insight into his dialect, but "kain significant and would seem to mark a corruption between Lughm and a Káfirí dialect. If, however, the "i" in "kain" is a mispr for "karn," then, "achch" and "nós" being proper dialectic forms, man may have known a real Káfirí dialect, though he certainly did no speak that of Gára (whose leather-bottle of wine, arrow and boots are i my possession). The words for the numerals up to ten are not given but we are informed that Dr. Bellew's Kafir was made to tell them of quickly on the fingers of his hands. This is a natural way for ascertain ing numerals, but it has its deceptions in dialects where each finger ha a name. The outstretched thumb and four fingers of one hand give th *Latin* V, the double of which $\frac{V}{\Lambda}$ or X is ten, beyond which number som races cannot go. The fingers of both hands interlaced or pushe against one another are likely to elicit a noun signifying multitude o collision. This, however, depends on the gestures used by the people which again depend on their habits, and these are influenced by the physical features of their country, their history and religion. On this point and on Gára's tribe I may have more to say in my next Section on Káfiristán.

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1 The candidates must be Government Gazetted Officers.

2. The Essays must be legibly written, or printed, not exceeding 32 Pages of the Size and Style of the Journal.

3. The Essays must be received by the Secretary on or before the 1st May 1881.

4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the candidate inside.

5. The Essays will be submitted for decision to eight referees chosen by the Council.

6. The name of the successful candidate will be made known at the Annual meeting and his Essay will be printed in the Journal.

By order of Council,

A. D. ANDERSON, CAPT.,
Honorary Secretary.

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By order of the Council,

A. D. ANDERSON, CAPT., R.A.,

Secretary, United Service Institution of India.

SIMLA,
14th July 1880.

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The address book is corrected up to date from the Army Lists, but mistakes are occasionally unavoidable, unless members themselves promptly notify their change of residence.

Members proceeding to England on leave, who wish the Journal to be forwarded to them while absent from India, should inform the Secretary, and send stamps for the postage.

When a member appears in orders for leave to England, his Journal is not despatched unless he asks for it, and while absent from India his subscription is not payable unless the Journal is supplied.

Members on return from furlough can obtain the numbers of the Journal that have been published during their absence, by paying the subscription for that period, and all members on returning to India should inform the Secretary of the fact.

The Secretary will be happy to send an Index to Volumes I, II, III, IV, V, VI, VII, and VIII, to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Secretary, United Service Institution of India.

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ORIGINAL PAPERS.

I.

MILITARY REFORMS IN INDIA.

PART II.

BY COLONEL A. R. GLOAG ROYAL ARTILLERY.

(*Continued from No. 42.*)

Having given a brief outline of the nature, and strength of the proposed future Native Army of India, we come now to the consideration of the nature and strength of the European force, which must be maintained in India, at any rate so long as present conditions exist. The European force in India at present consists of the following troops.

			MEN
10 Cavalry Regiments,	Strength	... ...	4200
15 Batteries Horse Artillery,	„	... ...	2175
43 do. Field do.	„	... ...	6235
38 do. Garrison do.	„	... ...	3040
49 Infantry Regiments	„	... ...	39,200
		Total ...	54,850

We have with this force the following Officers. R. A. Colonels and Lt.-Colonels 58, Cavalry and Infantry, Colonels and Lt.-Colonels 59, Artillery, Cavalry and Infantry, Majors 207
do. do. do. Captains 767
do. do. do. Lieuts. 1111
Or Field Officers 324 Captains and Subalterns 1878, these are calculated at full strength for Batteries, and Regiments, and of course excluding all Staff Officers. Horse Artillery is not required in India, it is a very splendid, but most expensive branch. It is indeed a moot point, now that Field Artillery has been rendered so perfect, and so mobile, whether Horse Artillery should be maintained, other than as a portion of the Household troops at home, and be designated "The Royal Horse Artillery of the Guard." The 15 Batteries of this arm might therefore be struck off the strength of the Indian establishments, and be replaced by 20 Field Batteries. The field batteries should, in a very large proportion, say at least two thirds of the number, be complete in themselves in every respect, as a Battery is the tactical Artillery unit, and should have their 2nd and 3rd lines of wagons and carriages complete and all well horsed, with camp equipage, ready to turn out on any emergency, and be able to march, or rail, or embark on board ship,

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as might be required on the shortest notice. Almost no attention whatever is given to these important points. These Batteries should be armed with 16, and 32 pounder R. Guns, the system of draught would then require modification, and the present clumsy and antiquated wagon should be abolished, and replaced by a simpler, and less cumbrous carriage, no difficult matter either.

No field Batteries are required south of Hydrabad in the Deccan, unless it be for purposes of health and convenience—this will be stated more fully when considering *location.*

Garrison Baterries are only required on the coast line, and then in but few places, and should be armed with modern, and not "*useless guns.*"

Probably not more than 20 of these Batteries would be required. More Mountain Train Batteries, say 12 in all would prove useful, if armed more heavily with a gun which could be taken to pieces. All obsolete smooth bore guns, carriages and stores &c., not absolutely required for immediate use, should be broken up or otherwise disposed of. It appears a needless extravagance to store them up in arsenals and depôts, to become honeycombed, ant eaten, rotten and mouldy, simply with the idea that, some day or other, they might come in useful. History does repeat itself, but even admitting this freely, we can hardly afford to maintain large lumber rooms in which to store obsolete guns, carriages, and other military machines, and Artillery Materiel, which have had their day, and been paid for! Besides it is a very irksome thing, both for officers and men always to be changing about from one gun to another, "simplicity, with unity and steadiness of system" would seem not to be much thought of in these matters at home and abroad. Our ordnance system seems now-a-days quite as worn out, and obsolete, as was the one which breathed its last, to the general satisfaction of all gunners on 25th May 1855, when LORD PANMURE, was secretary of state for War. It is, as it exists in these days a most heterogeneous and mixed arrangement, without much cohesion, or unity in its composition.

Our British Cavalry is not of so much importance as a *fighting* body as it was in the days of MURAT and COMBERMERE, when the IRON DUKE, ruled "the military roast." It is nevertheless quite as splendid as ever it was, and is now, or ought to be, the eyes and ears of the Army.

Our British Infantry is the finest in the world and is the real back bone of the Army, while the other branches are the muscular fibres holding the whole frame work together. With some slight alterations in the dress and equipment of the European Infantry soldier in India, he would become almost perfect, and indeed would be so could he but overcome his predeliction for strong drink in quantity without much regard to quality. He is a splendid and serviceable, though very expensive military unit, in India especially, but this we cannot possibly help.

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The famous Von Moltke truly says " the most active of all ingredients "in great military successes, and disasters, is one often overlooked by "historians viz, the will of the private soldier. Campaigns are not work- "ed out by machines on maps, but through mire or dust, by thousands "of sentient human beings, the more readily, and powerfully influenced "by sullenness, or cheerfulness, by despondency, or hope, by suspicion or "trustfulness, because, brought together in masses. And military history "will never be a perfect record of facts, until it learns to give full weight "to the most powerful of all the impulses which result in these facts, the "good or bad spirit of the soldier. When he leaves his bivouac in evil "temper, disaster and ruin go before his Commander, and the first check "he encounters, makes their dread forms appear."

The British soldier is of all others, the most discerning in the matter of the characters, and dispositions of those officers set over him, and when he has trust and confidence in them, nothing but death stays him on his onward career. In the ranks of the British Army may be found men of far greater capacity than is generally supposed, and far better informed on many points, than those who know them not would really believe, this too has almost always been the case. Napoleon's *Guides*—the Germ of the afterwards famous Imperial guards—first instituted after the Austrians surprised the French under Napoleon at Valeggio in the Italian Campaign of 1796-97—possessed this trust and confidence in their officers, and in their own *prestige* in the greatest perfection, and this it was that caused them to work wonders on the theatre of War, and Napoleon, no mean judge, said that the British soldier was even better still.

Our short service system has tended even already to reduce the quality of our soldiers and as it stands at present in its naked crudity it will never answer the requirements of an Army such as is necessary for the British empire, upon whose territory "the sun never sets," and in which every climate of our globe is encountered from the burning plains of Hindustan, to the frost bound plains of Canada. This system must be expanded, or we shall lose our Non-Commissioned Officers of by—gone days, the very soul of the Army, ; a large proportionof the men must be enlisted for long periods of service with the colours, say at least one third of the entire Army, and the British soldier should not under any but the most pressing necessities be kept in India over six years at a time ; he should not moreover be sent there till of mature age, that is till he is about 24 years old. This of itself necessitates a large proportion being enlisted for 12 years continuous service, unless we can find means of bringing soldiers to India to remain there three years only, without incurring excessive expenditure.

All volunteering to remain in India should be discontinued. Whether now that our communications between India and England are so perfect we can hold the country with 30,000 British soldiers, may perhaps ere long be worthy of consideration ; and even now perhaps, after all deductions are made, we probably seldom have more than

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45,000 efficient European soldiers in India at any given time. The short service system, if strictly adhered to, in combination with long service in India, will assuredly lead to some disastrous complications. Afghanistan, however its circumstances may be received from the European political stand point, or by the would—be holder of power in England, must now be retained, and till that troublesome territory has been fairly settled, and its people see that their religion, domestic hearths, their manners and customs, are not only respected by us, but in no way interfered with, and that all we desire is to introduce among them a wise and beneficent rule with perfect security of life and property within their own borders, and on our own immediate frontiers, till then must we of necessity maintain a large European force in India.

The principal portion of this force must be cantoned above central India, that is above Nagpore and Hydrabad in the Deccan, with its reserves, in hill stations easy of access, and in immediate communication with the posts on the coast lines. It is this Northern portion of India which contains the warlike races, possibly after a time, these peoples will become even as the Southern peoples, agriculturists and artisans, and ceasing to be generally warlike will "cease from troubling." That day however can only be seen through a very distant, dim, and uncertain future. We then, eliminating Horse Artillery Batteries, have the following European Troops in India.

		MEN
10	Cavalry Regiments	5,000
63	Batteries Field Artillery	11,340
20	do. Garrison do.	1,600
12	do. Mountain do.	720
50	Regiments of Infantry	40,000
	Total ...	58,660

We have already shewn that the Native Army consists of 128,000 of all arms, without guns, and that we have in addition the dangerous Armies of independent Princes and Chiefs aggregating 315,000 men, with 5,300 large guns.

We thus have, as it were, an indigenous army of 443,000 men with 5,300 heavy guns, composed entirely of the subjected races of India, an inflammable and combustible body, held, as we have frequently experienced, but very loosely, so to speak, by good pay in the one case, and by fear in the other, in their places, and moreover they do not possess any national or patriotic feeling *towards us.* Their guns, are to ours, insignificant, and their numbers of men are about as 3½ to one, when compared with the European Army.

As long however as the land owners, and agricultural population are contented, and satisfied with our rule, and taxation is not oppressive, or irksome, so long shall we be perfectly safe, with even much larger odds against us. This class of people have happily hitherto been very

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loyal, and have almost to a man always sided with us—it is to be hoped they will ever continue so to do, as they have every thing to gain by loyalty to us and every thing to lose by the reverse. The financial question can be but superficially glanced at in a paper on Military subjects. The public debt of India amounted on 30th April 1857 to £59,943,814, in the course of the following 5 years it rose to £99,652,053. In 1868 it fell to £95,054, 858.

In the following two years it increased £32,000,000, and on 31st March 1877, the total debt in India and in England, upon which interest was payable from Indian revenues, stood at £138,935,025, the total interest on this debt amounted in that year to £4,907,326. The total revenue in India and in England, in the same year, amounted to £55,995. The total expenditure in India and England, in this same year, amounted to £58,178,563. The revenue and expenditure for 1878/79 was estimated respectively at £63,195,000, and £61,039,000, leaving in favour of revenue, a surplus, of £2,156,000. This was the case as laid before the British Parliament, but we all know figures can be made to prove anything.

While I am writing there are rumours flying through the air, that the surplus will be more than £3,000,000. It is to be devoutly hoped that this is really correct, then shall we require no income tax.

The chief sources of revenue are, Land, Opium, and Salt, in 1877 these yielded respectively £19,857,152, £9,122,460, £6,304,658. In that year the cost of the Army amounted to £15,792,112, or exactly the combined Opium and Salt revenues.

Into this question it is impossible here to enter more particularly. I am not one of those who consider that India is bankrupt, or cannot possibly be made to pay her own way, and remain still a splendid appanage of the British crown. I do however assert that whether there shall be this year a surplus of revenue, or not, the reduction of the expenditure on the Military services of the Indian Empire is urgently called for and can only be satisfactorily attained by some such means as those I have indicated, however imperfectly I may have done so, together with even larger and more important reductions in the expenditure upon Civil Administration, and in the expenses needlessly incurred in England by the non-developement of our local resources which are for all practical purposes nearly sufficient for every requirement. It will be allowed, if what I have stated approaches to correctness, that our Military, and Financial affairs in this country, are unsatisfactory. There is but one more fact which I may here allude to before quitting this part of my subject and that is, the revenue collected in great Britain on account of India for the year 1877, amounted to £238,117, the amount which had to be paid in great Britain on account of India, by Bills from that country, in the same year was £13,467,763 at probably an average rate of exchange of little over 1-8½ per Rupee.

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The curious can calculate the loss upon this transaction, at their leisure. I have already said the chief way in which we can reduce this loss by exchange, is by steadily developing India's resources, increasing and perfecting the manufacturing departments, and establishing for this purpose large factories in suitable hill climates easy of access. All articles manufactured in India should surely be more reasonable in price than the same articles sent from England or Europe as labor is certainly more costly in these countries than it is out here, and in addition there is neither risk, freight, nor insurance to be paid on locally manufactured articles.

We now come to the concluding portion of our Military problem, viz the dress, pay, equipment, location, reliefs and routine work of our army in India under one Chief without a seat in the Viceregal Council, and having no voice whatever in matters regarding civil administration and the Government of the country. The Military should be severed completly from the Civil Administration. Cases are continually cropping up, of Military men, who, after being long absent from their Regiments, while Captains and Subalterns, and even Majors and Lieut. Colonels, come to their respective Commanders-in-Chief, and urge the hardness of their particular case in being denied military employment, they have generally been told that they should never have left their Regiments when in the lower grades, and that they cannot expect to come back and take away what has become the right of those who have stuck to purely Military duty all their lives. What Sir C. Napier wrote years ago, is quite as applicable to existing circumstances as it was when written. "The mode in which "Officers are extracted from the army, and placed in lucrative employment, "without reference to Military exertions, renders it impossible for the "Commander-in-Chief to maintain the requisite degree of Military spirit "discipline and efficiency in the (Native) army.

The present aspect of the Native armies with regard to their number of European officers, especially the southern and western armies is ample proof of the abstraction of officers, and the indifference to Military duty exhibited very frequently. The Commander-in Chief in India should be placed on a similar footing with the Commander-in-Chief at home. He should only be in contact with Government; his duties should be, if they are not already so, clearly defined, the Regulations of the army European and Native are sufficiently clear if perhaps too difficultly laid down. If war does come it is purely the result of political arrangements, of course I do not include such a thing as, rebellion, or Mutiny, with which he has no concern. The Commander-in-Chief, in fine, should have no further responsibility or interest at stake, other than those pertaining to the Commander of a Military expedition, he should provide for the number, description, and equipment of troops wanted for service, all his responsibility being absorbed by the Government in every particular except those pertaining to a Commander in the field in front of an enemy.

The Commander-in-Chief in India appears not to be in this position, and apparently never has been. The result has been that of four-

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teen Commanders-in-Chief in India from 1792 to 1850, ten resigned before expiry of term, and of the remainder who did not, two were Governor General as well as Commander-in-Chief. I have considered it necessary to touch upon this point, when writing on the subject of discipline in connection with the Military power of the Commander-in-Chief in India. The purely Military Work of the Commander-in-Chief efficiently and thoroughly carried out will occupy all his time, and exercise his energy, talents, and strength to the utmost limit.

Our reconstructed army then stands as follows, European 58,660 with 546 guns actually attached to them; Natives 128,000 without any guns. The dress of the European Army is still unsatisfactory, and unworkmanlike. A very wise experiment, as far as Cavalry and Artillery were concerned was lately made in England, to give a patrol jacket which would take the places of both the Tunic and Stable jacket. Combining neatness and utility, with ease and comfort while working, this experiment has found its way out to India, and is not yet completed. By all means let Officers and Men both of the European, and Native Armies, have a dress for grand occasions of all kinds, at the same time let them possess a really good, and useful fighting, marching, and duty dress, simple, and distinctive for each arm of the service. Do away with hard and fast rules of issue, both of clothing and bedding whereby the soldier must either take what he does not require, or must be paid compensation for not taking it. Let soldiers European, and Native only receive all articles when they really require them, that is when they are worn out by fair wear and tear within a certain period, or after they have become unserviceable within this period by no carelessness on the part of the soldier. If worn out in ordinary times before the expiry of the prescribed period the soldier should be made to pay for new, or half worn articles (these last are largely being utilised at home under very stringent orders) from stores, when available, and entirely abolish the compensation system. Better far reward the soldier who takes such care of his clothing that he makes it last a long time, not by throwing away money in paying him present compensation, but lay it up in store for him when he finally quits the service, for the reserve, good soldiers would benefit thereby, the indifferent and careless would lose on all sides.

The European Infantry soldier's serge tunic, and short boots with loose knee breeches, and gaiters of soft cloth, or sambre skin, and a good helmet without chain or spike, or any such glittering thing, makes an admirable fighting dress, always provided that the serge tunic was neither red, nor blue, but of a cloud grey colour, as well as his nether garments and helmet. The mounted man's long boots are unsuitable, and his breeches much too tight for convenience or comfort when mounting or dismounting and when grooming his horse. For him, the same loose short grey tunic, and grey helmet, with loose grey knee breeches, and long boots, lacing down the outside, through, hooks, not holes, after the style called " herring bone stitch," being

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secured below the knee at top, by a small strap and buckle, which would prevent the boot from sliding down the leg, and exclude all water, either when rain was falling, or when riding or wading through water, reaching over the boot top.

This kind of boot is easily laced on, and can as easily be unlaced and quickly kicked off the foot. Every one who has worn the present long boots, knows how much tugging and hauling, even unto the rending of the boot, takes place, when it is wet during the process of pulling off and on, much perspiration, loss of temper, and evil words too, take place with the hasty as well. The Bengal Native Army has, as a rule, been much more neatly, becomingly, and sensibly dressed than either of the other two. The dress therefore of the Cavalry and Infantry of our reformed army might be assimilated to the Bengal style, in combination with that recommended for the Europeau soldier. Such is the description of dress I would like to see worn, for fighting, marching, and working; I must leave the task of laying down a fancy full dress for the Army in India to those who have more vivid imaginations as regards tailoring than I possess. It should only be borne in mind that all changes in dress should be carefully introduced and no expense should thereby be entailed on the soldier.

The pay of the European soldier, as he is but a *mercenary* fighting machine, may remain as it is. Since time immemorial, and the days when the 66th Regiment Bengal N. I. was disbanded by Sir C. Napier, and the 66th Goorkhas put in its place, on account of an alteration to a very trifling extent in the pay, it has been found difficult, and even dangerous to meddle with the pay of the native soldier, because as Sir C. Napier said, when he held the G. O. G. G. C. of the time, reducing " the pay, in abeyance, " mercenaries will always exhibit symptions of dis- " affection almost amounting to mutiny if their pay be reduced suddenly, " and a large body of armed men in passive resistance to authority, is a " most dangerous spectacle."

In those days every article of food and raiment requisite for the native soldier's daily necessities and wants, was much cheaper than it is to-day, it is therefore not a reduction, but a slight increase of pay that I advocate, when the process of reforming and uniting the native army has been begun. There are certain places where special rates are in force such as Burmah, and these rates will require to be maintained yet awhile. The pay of the European Officers of the native Army requires some re-adjustment. They are too well paid in the higher grades, and too ill paid in the lower grades while serving, and their pay on retirement is not sufficient, now a days, to keep them even respectably, when there are families to be provided for and educated, since all expenses have of late years fearfully increased in England. Among all the changes that have taken place the old fashioned rates of pensions have still been retained. And while the civilian who draws very high pay, and lives on the fat of the land receives handsome pay on retiement

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the poor Officer is generally turned adrift after 35 years service with at most 25 shillings per diem. It would be advisable to readjust service pay, and increase pensions of all grades, in some such way as follows.

Subalterns 300 Rupees a month, Captains 500 Rupees Majors 600 Rupees, Lieut. Colonels 800 Rupees, with 200 Rupees Command pay, monthly. Subalterns after 15 years service £180 pension, Captains after 20 years service £250 pension, Majors after 25 years service £400 pension, Lt. Colonels after 30 years service £700, Lieut. Colonels after 30 years service should be compulsively retired, so should Subalterns, Captains and Majors who did not attain these grades within certain limits, that is the subaltern if he is not a captain after 15 years service, the Captain if he is not a Major after 20 years service and the Major if he is not a Lieut. Colonel after 25 years service. On the completion of 30 years the Lt. Colonel should be retired with a step of honorary rank. All Officers of the local service selected for commands in India other than regimental, should at once be placed on retired pay, and given command pay in addition, according to the nature and degree of their several commands. Exchanges between general service and local service officers should be permitted under certain restrictions as to length of service, and rank, none above the rank of Captain to be permitted to exchange. All should, in accepting a commission, be told that they might in certain cases have to serve any where, and then they should receive the same pay as was issued to them when serving in India.

The routine work of the armies of India is at present monstrously cumbersome, both as regards delays and expenses. We have such a number of different sets of regulations, and orders, in India, all overtopped by Home orders, and warrants of many kinds, as renders the conduct of military routine irksome to a degree. No Regiment or Battery of Artillery can move from the South, to the West, or North of India, without coming under new regulations at each change. This of course will not be the case in the event of the Army being made into a united whole under one chief, and the superfluous Establishments, and Departments abolished. As this in all probability will happen sooner or later, it appears unnecessary to swell my subject with useless details on the head of routine with which all are perfectly cognisant.

The question of location is a serious one, and a difficult one too, as may be seen by consulting the Military Map published by Colonel H. Grey in a paper in the journal of the Institution dated 20th September 1879.

The main points are with regard to the sites, they should be healthy, intercommunication direct and easy, European troops being placed wherever possible in large numbers, in hill stations, of which there are plenty in the Peninsula, and chief among those presenting

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the most eligible sites, is the Nilgiri range in the South, which ought to receive the whole of the reserve of the army of India, composed of all fresh Regiments as they land from England, and relieved every two years, or every year if need be, by fresh troops as they landed. The Head Quarters of each Corps d'armée might well be placed on hill sites, the different Brigades being located as circumstances demanded. By a careful study of the Map before referred to, it will be found even with every endeavour to keep each Army Corps as compactly located as possible, it is a very difficult matter to avoid, that curse of all military dispositions in India, small detached bodies. Certainly a very great deal has been done to render the sojourn of the British soldier in India as healthful as may be, but still more may, and can be done, and perhaps the persistent representations of many able men which have from time to time been made periodically within the last 20 years may result in a very large number of soldiers being located in the highlands of India.

The police force in India, and native reserve forces, may do a great deal more than has hitherto been effected, and so relieve a large number of British soldiers from duty, at any rate in the hot weather in the plains. During each cold season, each Brigade, or Division should be under canvas marching for at least 2 months, the health of the soldier is benefitted, and all ranks learn more of soldiering in this way during peace, than they can in any other way. Rifle practice, Artillery practice, and manœuvres, could then all be combined and just a little of the red tape, and routine work of the service abated for one sixth of the year. It might cost a little, but there are many ways of saving expenditure, to meet the cost of such a necessary measure as this. Marching and railing might both be adopted according to circumstances. Officers and men, would then become thoroughly conversant with the country all around, in which they might be called upon to act in real warfare at any moment. Such a display of energy, and activity would inspire the turbulent and lawless, with wholesome views as to the desirability of remaining peacefully disposed. Inactivity is the danger incident to an Indian cantonment life, and neither officers nor men, are proof against that lassitude which comes over all when long stationed in one place, more especially as each hot season comes round.

By a change such as I here advocate, all would be benefitted and the hospitals would in a great measure be emptied. In any plan for locating European troops the facilities for adopting such a course of procedure should be well considered. The question as to the disposal of women and children is of course a difficult one, but with shorter periods of service, in India, their numbers would diminish, as it would become absolutely necessary in a measure to curtail the number of women and children to be carried to and fro between England and India; to effect this it would become necessary to curtail the number of marriages, and this would result in lessening the number of

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early, improvident, as well as imprudent marriages, which so often do take place among soldiers. I have now briefly touched upon every point which I laid down at the commencement of this paper, I may therefore for the present close my labors, hoping ere long to find leisure to write more fully on certain military questions, which have been but hastily skimmed over in the present essay.

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II.

THE ELEPHANT IN FREEDOM AND IN CAPTIVITY.

A Lecture in two Parts.

By G. P. SANDERSON, Superintendent of Elephant Kheddahs, Dacca.

THE HON'ABLE SIR R. E. EGERTON K.C.S.I.,C.I.E., IN THE CHAIR.

Part I.

The Natural History and modes of capturing & training the Elephant,

The popular interest felt in the elephant is, perhaps, greater than that attaching to any other animal, but regarding none do more fallacious impressions exist. The opinion is generally held by those who have had the best opportunities of observing the elephant, that the popular estimate of its intelligence is a greatly exaggerated one; that, instead of being an exceptionally wise animal, its sagacity is of a very mediocre description. The truth of this opinion no one who has lived amongst elephants can doubt. It is a significant fact that the natives of India never speak of the elephant as a peculiarly intelligent animal; and it does not figure in their ancient literature for its wisdom as do the fox, the crow, and the monkey.

The elephant's size and staid appearance; its gentleness; and the ease with which it performs various services with its trunk; have probably given rise to the exalted idea of its intellect amongst those not intimately acquainted with it. And its being little known in Europe, whilst what is known of it justly makes it a favourite, leads to tales of its intelligence being not only welcomed with pleasure, but accepted without investigation.

One of the strongest features in the domesticated elephant's character is its obedience. It may also be readily taught, as it has a large share of the ordinary cultivable intelligence common in a greater or less degree to all animals. But its reasoning faculties are undoubtedly far below those of the dog, and possibly of other animals; and in matters beyond the range of its daily experience it evinces no special descernment. Whilst quick at comprehending anything sought to be taught to it, the elephant is decidedly wanting in originality.

What an improbable story is that of the elephant and the tailor, wherein the animal, on being pricked with a needle instead of being fed with sweetmeats as usual, is represented as having deliberately gone

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to a pond, filled its trunk with dirty water, and returned and squirted it over the tailor and his work. This story accredits the elephant with appreciating the fact that throwing dirty water over his work would be the peculiar manner in which to annoy a tailor. How has he acquired the knowledge of the incogruity of the two things, dirty water and clean linen? He delights in water himself, and would, therefore, be unlikely to imagine it objectionable to another. If the elephant were possessed of the amount of discernment with which he is commonly credited, is it reasonable to suppose that he would continue to labor for man instead of turning into the nearest jungle? The elephant displays less intelligence in its natural state than most wild animals. Whole herds are driven into ill-concealed enclosures which no other forest creatures could be got to enter; and single ones are caught by being bound to trees by men under cover of a couple of tame elephants, the wild one being ignorant of what is going on until he finds himself secured. Escaped elephants are re-taken without trouble; even experience does not bring them wisdom. Though possessed of a proboscis which is capable of guarding it against such dangers, the wild elephant readily falls into pits dug in its path; whilst its fellows flee in terror, making no effort to assist the fallen one as they might easily do by kicking in the earth around the pit. It commonly happens that a young elephant falls into a pit, in which case the mother will remain until the hunters come, without doing any thing to assist her offspring, not even feeding it by throwing in a few branches.

When a half-trained elephant of recent capture happens to get loose, and the approach of its keeper on foot might cause it to move off, or perhaps even to run away altogether, the mahout calls to his elephant from a distance to kneel, and he then approaches and mounts it. The instinct of obedience is herein shown to be stronger than the animal's intillegence. When a herd of wild elephants is secured within a stockade or kheddah, the mahouts ride trained elephants amongst the wild ones without fear, though any one of the wild ones might, by a movement of its trunk, dislodge the man. This they never do.

One of the chief characteristics of the domesticated elephant's temperament is, as before stated, its obedience; and it does many things at the slightest hint from its mahout, whose directions are not perceived by an on-looker unacquainted with the craft of elephant-guidance. The driver's knees are placed behind an elephant's ears as he sits on it, and it is by means of a push, pressure, and other motions, that his directions are communicated, as with the pressure of the leg with trained horses in a circus. It would be as reasonable to credit peforming dogs which spell out replies to questions with knowing what they are saying, as elephants with appreciating the objects to be gained by much which they do under the direction of their riders.

All who have had to deal with elephants will agree that their good qualities cannot be exaggerated; that their vices are few and only occur in exceptional animals: that they are neither treacherous nor retentive

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of an injury; and that they are obedient, gentle, and patient beyond all other domestic animals. But it is no traducement of the elephant to say that it is, in many things, a decidedly stupid animal.

The usually received notions of the height which elephants attain are much in excess of fact. Out of many hundreds which I have measured in the South of India and in Bengal, I have only seen one male of 9'10" vertical height at the shoulder. But the Maharajah of Nahun, Sirmoor, has a tusker at present of which I have obtained accurate measurements that is 10'5½" at the shoulder. This must be regarded as not less exceptional than a human being of 7'6". Few *female* elephants attain 8' at the shoulder; I have seen one of 8'5". Twice round an elephant's forefoot gives his height at the shoulder to within a few inches.

The age to which the elephant lives is, as must ever be the case with denizens of the forest, uncertain. The general native opinion is that they attain 120 years in exceptional cases (they have been known to reach this age in captivity), but, more usually, to 80 years. Under the more favorable conditions of a natural life the elephant must attain a much greater age than in captivity. I think it by no means improbable, looking to their peculiar dentition and other circumstances, that elephants live to 150 or 200 years, but this view is, of course, to a great extent suppositionary.

One of the most remarkable facts in connection with wild elephants is the extreme rarity of any remains of dead ones being found in the jungles. This circumstance is so marked as to have given rise to the belief amongst some wild tribes that wild elephants never die; whilst others believe that there is a place, unseen by human eye, to which they retire to end their days. The latter belief is untenable, as there are no parts of the forests of India that are not well known to, and occasionally visited by, the wild tribes who inhabit them.

In my own wanderings for several years through elephant jungles, I have only seen the remains of one female elephant that had died in giving birth to a calf, and of one elephant drowned in a mountain torrent. Not only have I never seen the remains of an elephant that had died a natural death, but I have never met any one amongst the jungle tribes, or professional elephant hunters, who had.

Sir Emerson Tennant says in his work on Ceylon:—"The natives generally assert that the body of a dead elephant is seldom or never to be discovered in the woods. And certain it is that frequenters of the forest with whom I have conversed, whether Europeans or Singhalese, are consistent in their assurances that they have never found the remains of one elephant that had died a natural death. A European gentleman, who for 36 years without intermission had been living in the jungle, ascending to the summits of mountains in the prosecution of Trignometrical surveys, and penetrating the valleys in tracing roads and opening means of communication—one, too,

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who had made the habits of wild elephants a subject of constant observation and study—has often expressed to me his astonishment that, after seeing many thousands of living elephants in all possible situations, he had never yet found a single skeleton of a dead one, except those which had fallen by the rifle. The Singhalese have a superstition in relation to the close of life in the elephant; they believe that, on feeling the approach of dissolution, he repairs to a solitary valley, and there resigns himself to death."

This quotation from Sir Emerson Tennant shows the similarity of opinion between the natives of Ceylon and of India. But the belief of a universal sepulchre is untenable on many grounds. It may be believed that, in annually capturing large numbers of elephants, the hunters of the Dacca establishment penetrate the most retired parts of the jungles of Assam, Chittagong, and elsewhere; but though many men have grown grey in the service, I have not met one who has seen a dead elephant's remains, except at a time when an epidemic disease decimated the herds in Chittagong. Jungle fires seldom penetrate the large forests; thus their bones cannot be burned. Monsoon rains do not destroy them for some years, as is proved by the bones of elephants that have been shot, and which may be seen many years later. It may be thought that aged, weak elephants are sometimes unable to extricate themselves from morasses or the soft beds of rivers where they go to take their last drink, and that their remains are swallowed up therein. This probably does occur occasionally, but there are many elephant-jungles where no quicksands or bogs exist. In Mysore the jungle streams are small, and their beds are uniformly rocky. If elephants died in these, their bodies would be floated down through inhabited country where they could not escape observation. But this has never, to my knowledge, occured. It is probable that the logevity of elephants may account to a great extent for their remains rarely or never being found. If elephants live for 200 years, the annual deaths from natural causes would only amount to 5 per 1000. This figure would, no doubt, be exceeded in reality, as elephants are liable to accidents, and to be killed by each other. Though the number that die annually is thus, probably, much less than might be supposed, the mystery of what becomes of the remains of those that do die is still entirely unexplained.

Herds of elephants usually consist of from 30 to 50 individuals, but much larger numbers, even upwards of 100, are by no means uncommon. A herd is always led by a female, never by a male. In localities where fodder is scarce, a large herd usually divides into parties of from 10 to 20. These remain at some little distance from each other, but all take part in any common movement, such as a march into another tract of forest. These separate parties are family groups consisting of old elephants with their children and grand children. It thus happens that, though the gregarious instincts of elephants prompt them to form large gatherings, if circumstances necessitate it a herd breaks up under several leaders. cases frequently occur when they are being hunted; each party will

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then take measures for its individual safety. It cannot be said that a large herd has any *supreme* leader. Tuskers never interest themselves in the movement of their herds; they wander much alone, either to visit cultivation where the females, encumbered with young ones, hesitate to follow, or from a love of solitude. Single elephants found wandering in the forests are usually young males, animals debarred from much intimate association with the herds by stronger rivals; but they usually keep within a few miles of their companions. These wandering tuskers are only biding their time until they are able to meet all comers in a herd. The necessity for the females regulating the movements of a herd is evident, as they must accommodate the length and time of their marches, and the localities in which they rest and feed at different hours, to the requirements of their young ones.

Elephant calves usually stand exactly 36″ at the shoulder when born, and weigh about 200 lbs. They live entirely upon milk for 5 or 6 months, when they begin to eat tender grass. Their chief support, however, is still milk for some months. I have known three cases of elephants having two calves at a birth. It cannot be said that the female elephant evinces any special attachment to her offspring, whilst the belief that all the females of a herd show affection for each others calves is certainly erroneous. During the catching of elephants many cases occur in which young ones, after losing their mothers by death or separation, are refused assistance by the other females, and are buffeted about as out-castes. I have only known one instance of a very gentle, motherly elephant in captivity, allowing a motherless calf to suck along with her own young one. When a calf is born the mother and the herd usually remain in that place for two days. The calf is then capable of marching. Even at this tender age calves are no encumbrance to the herd's movement; the youngest climb hills, and cross rivers, assisted by their dams. In swimming, very young calves are supported by their mother's trunks, and are held in front of them. When they are a few month's old they scramble on to their mother's shoulders, and hold on with their forelegs, or they swim alone. Though a few calves are born at other seasons, the largest number make their appearance about September, October, and November.

The elephant is full grown, but is not fully mature, at about 25 years of age. At this period it may be compared to a human being of 18; and it does not attain its full strength and vigor before 35 years. Female elephants give birth to their first calf at from 13 to 16 years of age, when they are still palpably immature themselves. I need hardly say that only the male Indian elephant has tusks; the female is provided with short tushes, or downward prongs, in the upper jaw; they are seldom more than 4″ in. length. On the continent of India *mucknas*, or *male* elephants without tusks, are decidedly rare. The absence of tusks appears to be a merely accidental circumstance. But in Ceylon male elephants *with* tusks are still more uncommon. Sir Samuel Baker says that not more than one in 300 is provided with them. It is

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difficult to imagine what can cause the vital difference of tusks, and no tusks, between the elephants of the Continent and of Ceylon, as they are of the same species, and the climate, and their food, may be said to be identical. Elephants occasionally lose one, sometimes both, tusks in accidents in the jungle, and some have only one tusk from birth. The latter are known as Gunéshes, and are reverenced by Hindoos if the tusk retained be the right hand one. Elephants never shed their tusks, nor are those lost ever renewed. The records of many hundred elephants captured by the Dacca establishment show that there are about 43 male elephants to 100 females; and 1 muckna, or *tuskless* male, in every 10 males.

Elephants are exceedingly inoffensive and retiring in their habits. They are very timid in their wild state, and withdraw at once from the intrusion of man. They usually drink after sunrise and before sunset. They prefer the water of the small tributary streams to that of the larger rivers of the jungles they may be inhabiting, for what reason I have never been able to ascertain. Elephants seldom bathe after the sun is down, except in very warm weather. They swim remarkably well, as is proved by the fact that large numbers of elephants are annually sent across the tideway of the Ganges between Dacca and Barrackpoor, and are sometimes 6 consecutive hours without touching bottom. I have seen an elephant swim a river 300 yards wide with its hind legs tied together. Elephant are sometimes drowned, apparently by being attacked with cramps, or with a fit.

The only pace of the elephant is the walk, capable of being increased to a fast shuffle of about 15 miles an hour for a very short distance. The elephant can neither trot, canter, nor gallop; nor can it make the smallest spring either in vertical height or in horizontal distance. A trench 8 ft. wide and 8 ft. deep is quite impassible to an elephant.

It has been satisfactorily settled that there is no such creature as a white elephant; the so-called albinos of the Kings of Burmah and Siam being merely elephants of a somewhat dirty cream color, and in some cases even elephants of the ordinary color, but with an unusual amount of the flesh colored blotchings upon the face, ears, and neck, common in some degree to all elephants.

The belief that wild elephants have decreased in India is not an uncommon one, and may have arisen from the fact of laws having been passed in late years for their protection. Also from their undoubted decrease in Ceylon. But the case of that island is not analogous to that of the Continent. In Ceylon elephants have always been made a peculiar object of pursuit by large numbers of sportsman, and by paid native hunters, whilst their range is not without its limits. But on the Continent of India, the number shot by European sportsmen has always been small; and it was only for a few years that natives were induced

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to turn their attention to killing them by a reward given for their destruction in the Madras Presidency. This was soon withdrawn, and the representations of humane officials having further led to the curtailment of the wasteful methods of trapping them practised by native hunters, the wild elephant now enjoys perfect immunity throughout the Western ghats, and those boundless forests extending for hundreds of miles along the foot of the Himalays into Burmah and Siam. The number annually caught by the Government hunting establishment at Dacca (the only one at present working in India,) and by licensed native hunters, is, comparatively speaking, very small; and there is no doubt that all the forest ground that can be legitimately allowed to the wild elephant is as fully occupied at present as is desirable. The elephant catching records of the past 50 years attest the fact that there is no diminution in the numbers now obtainable in Bengal, whilst in Southern India elephants have become so numerous of late years that they are annually appearing in places where they had never been heard of before.

In the Billigarungun hills, an isolated range of 300 square miles on the borders of Mysore, wild elephants first made their appearance about 80 years ago, having strayed from the forests at the foot of the Neilgherry range across an intervening strip of some 30 miles of civilized country. Prior to that time the Shōlagas, a wild tribe that inhabit those hills, but which have now dwindled down to a handful of savages, were a numerous people; traces of their former extensive cultivation, even of orange groves, gardens, and iron-smelting furnaces, still exist, together with tanks on the summit of the hills for the convenience of the cattle which used to be annually driven thither from the neighbouring low country for pasturage during the hot weather. The Shōlagas were almost destroyed by three successive visitations of small-pox, a disease which is always exceedingly fatal amongst hill people in India; their lands relapsed into the densest forest; and wild elephants and bison now abound where not one was to be found a century ago. The case of the Billigarungun hills is an interesting instance of a large tract of country in India having relapsed into a wilderness in recent times.

The strict preservation of wild elephants seems only advantageous, or desirable, in conjunction with corresponding measures for keeping their numbers within bounds by capture. It is to be presumed that elephants are preserved with a view to their utilization. With its jungles filled with elephants, the anomalous state of things by which Government, when obliged to go into the market, finds them barely procurable, and then only at prices double those of 20, and quadruple those of 40, years ago, will I trust be considered worthy of enquiry. Whilst it is necessary to maintain stringent restrictions on the wasteful and cruel native modes of hunting, it will, I beieve, be found advantageous to allow lessees every facility for hunting under conditions that shall ensure humane management of their captives. I believe that the price of elephants might be reduced one-half in a year or two by such

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measures. The most ordinary elephant cannot be bought at present for less than Rs. 2,000. Unless something be done, it is certain that the rifle will have to be called into requisition to protect the ryots of tracts bordering upon elephant jungles. To give an idea of the numbers of wild elephants in some parts of India, I may say that, during the past three years, 503 elephants have been captured by the Dacca Kheddah establishment in a tract of country 40 miles long by 20 broad in the Garo Hills, whilst not less than 1000 more were met with during the hunting operations. Of course these elephants do not confine themselves to that tract alone, but wander into other parts of the hills. There are immense tracts of country in India similarly well stocked with wild elephants.

I am sure it will be regarded as a matter for hearty congratulation by all who are interested in so fine and harmless an animal as is the elephant, that there is no danger of its becoming extinct in India. Though small portions of its haunts have been cleared for tea or coffee cultivation, the present forest area of this country will, probably, never be practically reduced, for reasons connected with the timber supply and climate of the country; and as long as its haunts remain, the elephant must flourish under due regulations for its protection.

I will now pass to the modes of capturing and training the elephant. Elephants are not bred in captivity in India, as by the time the young ones would be of a useful age, 15 years, they would have cost more than would suffice to capture a number of mature wild ones. Elephants are, however, bred extensively in a semi-wild state in Burmah and in Siam, where fodder is very plentiful. With the exception of such elephants as come from Burmah, almost every elephant seen in India has been wild at one time.

The following are the methods of taking wild elephants. For *single* elephants, pit-falls; running down and noosing from trained elephants' backs; or, tying the animal's legs together under cover of trained females, usually called decoys. When a whole herd is the object of pursuit, a salt-lick, or sometimes a pool in the jungles, is surrounded by a stockade. Men are constantly on the watch and the gate is closed when a herd has entered. But the most certain plan is that followed by Government, namely, the surrouning a herd wherever found in the forest by a large circle of men, and the building a stockade into which it is driven. This method will be described further on. With regard to the other plans mentioned, the pit-fall is an old native method, and is now prohibited. It may be imagined that an immense majority of the elephants that fell into pits from 15 to 18 feet deep sustained permanent injury, if they were not killed outright, as often happened. The native hunters seldom took the trouble to put boughs into pits to break the force of an elephant's fall. If an elephant was seen to be injured, it was left to die as it fell. I have known four elephants to fall into the same pit together, one only of which was got out alive.

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The pits were arranged with great ingenuity by the hunters. Sometimes an uncovered one would be left in view, in avoiding which an elephant fell into a covered one alongside. Or several were dug in close proximity, in which others might be taken when fleeing in terror upon the fall of one of their number. Through the carelessness of the hunters, who only visited the pits occasionally, elephants were frequently starved to death before they were discovered.

The plan of enclosing elephants in a salt-lick, formerly much in vogue in Assam, also led to much cruelty. Natives could seldom procure a sufficient number of tame elephants to deal with a large herd, should one be enclosed; and in former days scores of elephants died in enclosures from want of food during the delay that occured in sending for tame elephants. Several of these salt-licks are perfect Golgothas to this day. Such reckless waste of elephant life has now, however, been put a stop to.

Running elephants down and noosing them with tame elephants is very rough and dangerous, but highly exciting, sport. It is far from an economical method of taking them, as the wear and tear of the tame elephants is very great. It is conducted as follows:—Three or four fast tame elephants are equipped with a rope each, at one end of which is a noose, the other being secured round their bodies. On some the noose is on the near side, on others, the off. Each elephant has three riders, the mahout on its neck to guide it; the nooser kneeling on a small pad on its back, holding the open noose in his hands; and a spare man seated behind, whose duty it is to hammer it unmercifully with a spiked mallet. This urges an elephant to a much greater pace than any use of the driver's goad will, though that inducement is by no means omitted.

Thus equipped the elephants approach a herd of wild ones. Sometimes a musket is fired to terrify them, and the chace commences through or over everything, the men saving themselves from being swept off as best they can. Where the ground is favourable, the tame elephants endeavour to range up on opposite sides of a fleeing wild one, of moderate size and strength, when the nooses are cast, and generally encircle its neck. If this is effected the tame elephants are checked; but the choking of the wild one, or fatal accidents to the tame ones or their riders, by being pulled over, or dragged into ravines, or by being attacked by other elephants, are not unusual accompaniments to this rough work.

Hand-noosing is practised only in Ceylon, where a couple of hunters on foot manage, with wonderful skill and activity, to noose the hind legs of an elephant when running away, and to secure the trailing ends of the ropes to trees as it passes.

The largest male elephants cannot be captured by the above plans; and from their habit of frequently absenting themselves from their com-

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panions, they are seldom caught with the herd by the stockade, or kheddah, plan. They are the most valuable beasts, and are usually caught in the following manner, or some modification of it. Four or five steady females, ridden by their mahouts, who partly conceal themselves with a dark-colored blanket as they lie on their elephants' necks, are taken to the jungle where the solitary male is known to be, and are there allowed to graze like wild ones, and gradually to approach the male, if he does not take himself the initiative. Some wild males make off at once, probably scenting the riders, but many abandon themselves without reserve to the society of the females. These keep in constant attendance on the male, sometimes for two days and nights. When the male seems inclined to sleep soundly, usually soon after sunrise, the females stand close around him, and a couple of mahouts on foot tie his hind legs together, and bind him to a tree if one be near; or they withdraw the tame elephants, and after the male has tired himself out by dragging his legs after him in his flight, he is fastened to some tree as he passes it. In a day or two cables are got round his neck, and he is marched off.

I may here say that the term decoy, often used in reference to elephants engaged in the capture of others, is entirely misleading, as they use no arts to divert the wild one's attention, as has been constantly asserted, but act entirely at the command of their riders. The statement that one elephant will assist in binding another, except in as far as it will hand up the end of a rope, or pull one when ordered to do so, is entirely incorrect.

The Government kheddah plan is the most certain and economical method of taking wild elephants. As many as 118 have been secured in one drive by this means. A Government hunting party consists of 370 men, trained to the work. They are generally from Chittagong, the natives of that district being unrivalled in the craft. There is a large surplus laboring population in Chittagong, and there is no difficulty in raising one or two kheddah parties during December, January, and February, when there are no agricultural eperations on hand. The men receive two and half months' pay at Rs. 7 per mensem, and they also have free rations.

A kheddah party of 370 men having been collected, it marches to the hunting grounds, sometimes 200 miles distant, where a base camp is ready, and where the estabishment of tame elephants, generally from 100 to 150, has been collected, together with the stores, tools, and ropes required for the operations. Muskets and rations having been delivered to the men, and religious ceremonies for success having been performed, the hunters enter the jungle. The trackers of the party have probably already marked down a herd, whereupon the hunters approach to within a mile, and then divide under two experienced leaders, one half filing off to the right, the other to the left, their object being to enclose the herd in a large circle by meeting beyond it. A man is left at every 30 yards or so

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along the lines, according to the nature of the ground. The skill with which this movement is effected is very remarkable, as the ground is usually quite unknown to the hunters, and the difficulty of crossing streams and hills, of forcing their way through dense jungle where no paths exist, and of gaining the point they are making for without a compass, is considerable.

The circle when completed is often 5 or 6 miles in circumference. A large one, with men posted 50 yards apart or so, is more efficient in keeping in a herd than a smaller one, with men much closer. Unless plenty of room be allowed to the elephants they are liable to break through the cordon of guards; but it is a maxim in elephant catching that, the circle having once been formed, a herd can only escape through accident or great carelessness. It usually takes three or four hours to surround elephants. In a couple of hours the hunters run up a thin fence of split bamboos round the enclosure, and clear a path for communication between each others posts. Their chief duty then is to see that the elephants do not break out of the circle. The animals seldom give trouble during the day: at night large fires are kept up, and shouts and shots are used to drive them back should they approach. The bamboo fencing serves to show the chief hunters, who patrol the circle at intervals, where the elephants have broken out should they escape, so that the particular men who are to blame can be detected. This investment of the elephants may have to be maintained for a week, sometimes for a month, if the elephants cannot be secured in the first attempts.

The elephants usually give some little trouble for the first two nights, but their conservative nature then seems to lead them to believe that there are set bounds to their wanderings; and unless fodder or water becomes scarce they seldom try to force the guards. A small herd always gives more trouble than a large one. The former may only be a wandering party from some large body of elephants not far away; it then shews a determination to break through to join its companions. A small herd, too, probably has no calves with it, which is a great disadvantage, as it is then restless and quick in its movements. And a herd of a dozen elephants or so may be well in command of one courageous leader; whereas, in a large gathering, timid animals preponderate so greatly that a panic is easily established, and elephants that might otherwise behave boldly become infected with the general fear.

One or two of the males of a herd frequently pass in and out of the circle; and I have known several cases in which a portion of a herd has been absent when their companions were surrounded, and has been admitted by the guards by withdrawing at the point where it wished to pass in. Sometimes, but not often, men are killed at their posts by the elephants.

On the day following the investment of the herd, the construction of the kheddah, or small enclosure into which the elephants are to be

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driven, is commenced. It is situated on one of their chief paths (within the circle) and is constructed with the trunks of young trees about six inches in diameter, and 12 feet high, arranged in a circle of from 20 to 50 yards across. Inside, round the foot of the pallisades, a trench 4 feet wide and 4 feet deep is dug, the earth from this being thrown up into a bank on the inner side. The trench and bank of loose earth usually deter elephants from attacking the stockade, or should they do so, prevent their employing their full force against it. Still I have seen elephants cross the trench and force their way through the pallisades. The lack of intelligence in the elephant is illustrated by the fact that a herd never assaults the pallisades in a body; and even should one break through, the others do not follow it. The pallisades are lashed together with canes and are strongly supported by cross beams and forked supports behind, the whole structure being designed to support outward pressure only. Were elephants to pull the pallisades inwards they would yield at once, but they never use their trunks for this purpose. An entrance of 4 yards in width is left for the ingress of the herd, and a gate, studded inside with sharp spikes, is either slung from the trees overhead, or is made in two leaves, and is pushed to upon the entrance of the herd, by men stationed behind it.

A stockade of 40 yards in diameter accommodates 100 elephants easily. To guide the elephants into it, two lines of strong pallisades are run out from the gate along each side of the path by which the herd is to approach. These guiding wings diverge to perhaps 60 yards across at their commencement, which may be 100 yards or so from the gate. When the whole is completed, the new wood work is hidden with leaves and branches. The stockade is usually completed in three or four days. The hunters consider Friday the most lucky day for driving, and they make extraordinary efforts to get the stockate ready by that day if possible. The work of the stockade is done by one-half the hunters being taken from the large circle from morning till evening daily, as a weak cordon of guards suffices to keep the elephants in during the day.

All being in readiness for driving, a number of men are taken from the original circle, and a smaller interior surround is formed by commencing at the guiding wings of the kheddah, and posting the men until the elephants are again enclosed. The original circle is, of course, still maintained, in case of the elephants breaking through the inner one. If the herd be in two or three detachments, as frequently happens, these are quietly driven together, and the whole are then moved forward towards the kheddah. Should they show an inclimation to break to the right or left, the men deter them by striking their axes against the trees. When the elephants gain the funnel-shaped approach to the stockade, the men close in from behind, and from the sides, and urge them on with shots and shouts. If the herd suspects danger, and breaks back through the beaters, fatal accidents not uncommonly occur. Sometimes a herd declines altogether to go in the direction of the stockade, owing to their having the wind from that quarter. In such

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a case a new stockade, may have to be constructed, and if that does not succeed, others also. In this way elephants are sometimes kept in a surround for a month.

Supposing the herd to have been got within the wings near the gate, a line of dry grass and bamboos arranged beforehand is fired, and their retreat is cut off. They then sometimes attack the guiding pallisades, but men with spears and muskets receive them here; I have seen two cases in which the elephants forced the pallisades, and killed men behind them. Tame elephants are used, if possible, to assist at this stage of driving, chiefly as a protection to the men on foot, who run behind them should any elephant turn and charge. There is much less danger of this occurring in dealing with large herds than with small ones, as should a single elephant charge out of a large herd, it is rarely supported, and it quickly rejoins its campanions. But a determined leader of a handful of elephants is liable to be followed at once by the rest. When an elephant chases the men, they betake themselves to the shelter of tree trunks, bamboo clumps, or long grass, and it is astonishing to see how they frequently escape uninjured. I have known many cases of men standing against a tree, or hiding in tufts of long grass, within a couple of yards of elephants that were pausing in indecision, without being discovered, though the elephants were evidently aware of their close proximity as they kicked up the ground in anger, and then made off. In such cases the slightest movement would have led to the hunters being instantly trampled to death. Men are frequently killed, of course, but they are almost always young hands who are learning. I saw one such make a narrow escape a few months ago; he ran from an elephant and climbed a tree, the elephant butted the trunk and the man fell down, but his pursuer was so astonished at the sight that she fled at once.

Sometimes drives are conducted by torch light, and these seldom fail owing to the elephants fear of fire. The scenes on these occasions are exciting beyond description. The elephants in rushing along tear down large branches of trees that are connected with the undergrowth by climbing plants, and even sometimes upset dry trees bodily in their passage. The cries of the calves, and the deep, thunder-like growls of the elders of the herd; the continued crashing of the jungle; and the shots and incessant cries of the men, form, with the unnatural light of the fires, and of torches moving through the forest paths, a scene that cannot fade from the memory of any one who has once witnessed it.

When a herd has been driven into the stockade, the gate is closed and barricaded, and men with firebrands and spears repel any attacks upon it or the pallisades. But the trench is usually sufficient to deter the elephants from crossing it. On the same or following day 10 or 12 tame elephants are admitted with a mahout and rope-tier upon each, and it is a very remarkable fact that the wild ones very rarely attempt

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to dislodge the riders, as they easily might. They naturally fail to comprehend anything so foreign to their experience as a man upon an elephant's back. I never knew a case, except one that happened to myself, of any rider being attacked by a wild elephant. The mahouts separate the wild elephants one by one from their companions, when their hind legs are tied by men who slip to the ground for the purpose. A rope is then secured round each captive's neck, and to its hind legs, and it is led out and picketed in the forest near.

If two well matched rival tuskers happen to be impounded in one stockade, they sometimes fight to the death, seemingly regardless of their novel position. If not well matched the more powerful one bullies the weaker one incessantly. This year, in January, when a herd of 48 elephants had been impounded, a scene of this kind occurred, one elephant following and fighting with another almost continuously for two days and nights. The smaller elephant retaliated on others weaker than himself, and between them the pair killed four young elephants and a large muckna. They caused such commotion that the tame elephants could not be admitted. At last the larger tusker forced the smaller one across the trench and against the pallisades. The latter commenced to break his way out; and though muskets were fired into his face, and spears and digging tools, made red hot for the occasion, were applied to his trunk and head, the inducement behind was so strong that the counter efforts of the men were unavailing, and he made his way through the stockade, and went off into the jungle. This was at 2 A. M., and was a sufficiently exciting scene. No other elephants attempted to follow, and the gap was repaired.

Amongst these 48 elephants was one that had escaped about 12 years ago, judging from the age of her calves. We first observed the fact of her being an escaped elephant by seeing old rope marks on her legs. When the tame elephants entered the stockade, two ranged along side this one, and on being pricked with a spear, and told to kneel, she obeyed at once. She was ridden alone a few days afterwards. Two other escaped elephants were also captured this year (1880) amongst the 217 elephants taken.

The number of wild elephants that can be taken care of is, at the most, 50 per cent. more the tame ones. As each capture is concluded, the wild elephants are marched out of the jungle into open country, for if kept in the forest they continue to be excited by jungle sights and sounds, and struggle for their liberty, whilst flies are much more troublesome to their wounds in the jungle than in the plains. Each batch of new elephants requires a number of tame ones to be detached in charge of it, thus the hunting operations are limited by the number of the latter.

When a sufficient number of elephants has been taken, the hunters are dismisied, and all elephants under 6 feet in height are sold to

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merchants who follow the kheddah parties for the purpose of purchasing such. Those above 6 feet are retained for Government service, except some males and old females, which are also disposed of. Not more than 40 per cent. of the elephants captured are young and strong females, thoroughly suitable for Government service. The selected wild elephants are now divided into gangs of twenties, with a proportion of tame ones in charge. These escort the wild ones, bring their fodder, and lead them to water daily. The march from the jungle commences about the end of February, and the elephants reach the depôt at Dacca in May. They are then put into training, and by November are quite steady, and are drafted for military service.

New elephants are trained as follows: They are first tied between two trees, and are rubbed down by a number of men with long bamboos, to an accompaniment of the most extravagant eulogies of the animal, sung and shouted at it at the top of their voices. The animal of course lashes out furiously at first; but in a few days it ceases to act on the offensive, or as native say. "Shurum lugta hai," "It becomes ashamed of itself," and it then stands with its trunk curled, shrinking from the men. Ropes are now tied round its body, and it is mounted at its picket for several days. It is then taken out for exercise, secured between two tame elephants. The ropes still remain round its body to enable the mahout to hold on should the elephant try to shake him off. A man precedes it with a spear to teach it to halt when ordered to do so; whilst as the tame elephants wheel to the right or left the mahout presses its neck with his knees, and taps it on the head with a small stick, to train it to turn in the required direction. To teach an elephant to kneel it is taken into water about 5 feet deep when the sun is hot, and upon being pricked on the back with a pointed stick it soon lies down, partly to avoid the pain, partly from inclination for a bath. By taking it into shallower water daily, it is soon taught to kneel even on land.

Elephants are taught to pick up anything from the ground by a rope, with a piece of wood attached, being dangled over their foreheads, near to the ground. The wood strikes against their trunk and forefeet, and to avoid the discomfort the elephant soon takes it in its trunk, and carries it. It eventually learns to do this without a rope being attached to the object.

(The following was not included in the lecture.)

THE BREEDING OF ELEPHANTS.

The question has sometimes been raised whether it is the male or female elephant that comes into season. I have heard the opinion advanced that it is the former; but it is an erroneous one, probably founded on the fact of most male elephants in captivity having periodical paroxysms of *must*. Some elephants never, or only at long intervals, have these fits; in others they are of tolerably frequent occurrence. They occur also in wild individuals, chiefly in the cold

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weather from November to February. The temples swell, and an oily matter exudes from them, as in tame elephants, but the wild elephant shows no violence whilst under their influence. The occurence of *must* in tame elephants is connected with their condition, and rarely appears in animals below par. It does not occur in animals under about 30 years of age, though tuskers breed from the age of 20.

There is ample proof that it is not the male elephant that comes into season. In following single male elephants with a view to capturing them with trained females, they may generally be relied upon to make advances to the females, usually to some particular one, and the efforts of the mahout are frequently necessary to keep her out of the male's reach.

The period of heat is not marked by any particular signs in the female, which has probably helped to strengthen the erroneous opinion spoken of. In approaching a male elephant a female desirous of his attentions utters certain sounds, and courts his society; but only those conversant with elephants would notice this. It frequently happens that the tame females of a kheddah party are found to be in calf after work in the jungles, where wild males have access them, though no indications of their being prepared to receive the male were observed even by their keepers.

It has been a disputed point as to the manner in which the connection between the two sexes takes place. Some have supposed that the female kneels or lies down to receive the male, but this is not the case. I have myself, on four different occasions, witnessed the act, once by two animals belonging to a wild herd in jungles; on the others by animals which had just been caught, and which were at large within the kheddah enclosures. On each the female elephant stood to receive the male in the manner common to all quadrupeds. The opposite opinion may have arisen from the fact that it is possible for a heavy male to bear down to her knees a female much smaller than himself. On none of these occasions did the male elephant exhibit signs of *must*, which shows that it is not only when under its influence that male elephants court the society of the females.

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Part II.

THE ECONOMIC VALUE OF ELEPHANTS TO GOVERNMENT; THEIR MANAGEMENT AND TREATMENT.

At the present day, when railways and good roads have modified the requirements of military transport, elephants are not so necessary with troops as formerly. They will, of course, always be required for the carriage of frontier regiments in Assam and Burmah, as the conditions of those countries will always preclude the use of any other means of transport. But in most parts of India proper, elephants may, undoubtedly, be greatly reduced at the present day.

The time seems to have come, therefore, when the future use of the elephant as a means of carriage may be considered with advantage. I propose to divide the subject as follows:—

I. What number of elephants need be maintained for military purposes henceforth?

II. How may they be most economically supplied?

III. A proposition for greatly reducing the keep of elephants by abolishing their grain ration.

IV. Can elephants be moved by rail for service in different parts of India?

V. Improved gear for elephants.

VI. Hints on management and treatment.

There are at present 1,307 elephants belonging to the Commissariat Department throughout India, *viz.* 1,016 in Bengal and Northern India; 78 in the Bombay Presidency; and 213 in Madras and Burmah. There are also about 300 elephants belonging to the Forest, Frontier Police, Railway, Telegraph, Public Works, and other Departments throughout India and Burmah, or a total of (approximately) 1,607 government elephants.

The Army Commission has already considered the question of the reduction of Commissariat elephants, and has, I have permission to state, recommended that the 1,307 belonging to the Commissariat Department be reduced to 400, 907 being sold, and the proceeds, estimated at 9 lacs, or Rs. 1,000 per elephant, applied to the purchase of other means of transport. Some such reduction as this is, I think, feasible.

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Supposing 400 to be the number to be hereafter maintained by the Commissariat Department, the question presents itself,

II.—How may the animals required to maintain that strength be most economically obtained?

Elephants come under two classes only—the one of pageantry, the other of utility. Most Native Princes and Noblemen of distinction keep elephants to swell their retinues; for this purpose male elephants alone are valued. Scarcely any limit can be placed on the price of a really perfect tusker. Animals of any pretensions at all command from Rs. 5,000 to 15,000, whilst Rs. 20,000 is not an unknown figure. But Government has little interest in this class of elephant. With the exception of a few males kept for State purposes, Commissariat elephants should, in my opinion, consist exclusively of females. These are more generally useful; are more reliable than males; and do not suffer from *must*, which occasionally renders male elephants unfit for service for many weeks together.

The price of an ordinary baggage elephant is at present Rs. 2,000, which is double that of 20, and quadruple that of 40, years ago. As the jungles of India are probably better stocked with wild elephants at present than they ever have been within recent times, it will be interesting to enquire into the causes that have occasioned this rise of price. The gradual advance in value of labor and of commodities must of course have affected elephants; but I believe the chief reason of their present disproportionately great cost over former years to be, the closing of large tracts of jungle to native hunters, either from their having been taken up as Forest reserves, or as Commissariat hunting grounds; whilst the favorite native method of running down and lassooing elephants has been prohibited. I believe the true method of keeping down the price of elephants to be, to make the restrictions and money impositions in the shape of royalty on their capture as light as possible.

The present terms upon which leases are granted to natives take the form of a money royalty on each elephant caught; or, Government takes a portion of the elephants captured as a tax, and retains the right of purchasing a portion of the remainder at half their market value.

I estimate these terms as amounting, generally, to about half of the lessee's profits. This might be considered to be a heavy imposition, as some considerable outlay is necessary, and all the risk rests with the lessee.

I will not here enter into the question of revision of the present hunting rules, but I think that any loss Government might sustain in diminished imposts at the jungle, were the tax made lighter, would be more than counter-balanced by the advantage of a cheaper and better-stocked market to resort to on emergencies. Stringent laws have been passed of late years for the protection of wild elephants; and I think it advisable that native hunters should be allowed every facility for

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capturing them, under restictions that shall ensure economy of life amongst, and humane treatment of, their captives.

My predecessor in the charge of the kheddahs, Mr. Nuthall, was opposed to the native method of capturing wild elephants by lassooing, considering that it led to the breaking up of the herds into small parties; and upon his recommendation noosing has been prohibited. Where kheddah operations are to be carried on, the success of which depends greatly on the herds being large and undisturbed, the frequent attacks of noosers upon them is certainly disadvantageous; but there are many tracts where kheddahs can never be worked, owing to the physical nature of the country, and where, as long as the elephants are not driven out of British territory, noosing might be permitted. This method of taking elephants is in great favor with natives. Small zemindars living on the borders of elephant jungles can keep three or four hunting elephants at little cost, as they turn them out to graze in the non-hunting season, and the capture of a few wild elephants yearly pays them well. In kheddah operations an outlay in advance of from Rs. 5,000 to 10,000 must be borne, whilst success is not certain; and this deters many natives from engaging in this method of hunting.

Whilst alterations in the present hunting rules may be looked to to effect a great change in the market, Government should, in my humble opinion, always have its independent source of supply in its own Kheddah Establishment. The Army Commission has recommended that the Kheddah Establishment be done away with, and such elephants as are requierd to maintain the Commissariat strength at 400 be obtained from native hunters as Government share of their captures.

To maintain a strength of 400 elephants, at least 20 animals per annum, or 5 per cent., would be required in ordinary times, and more than double that number on occassions of arduous service. When required to furnish a smaller number of elephants than at present, the expenditure on the Dacca establishment could be reduced from the present Rs. 1,20,000 to Rs. 1,40,000 per annum, to Rs. 90,000. Suppose that 150 elephants were caught annually, 30 picked females (or 7½ per cent. upon the 400 Commissariat elephants) might be retained, and, allowing 20 casualties, 100 males, females, and calves, would remain for sale. If these realized an average of Rs. 800 each, or a total of Rs. 80,000, the 30 females could be supplied to Government, trained for service, for Rs. 10,000, or Rs. 333 each, as against Rs. 2,000 each in the market.

I cannot think Government would find it advantageous to abolish its hunting establishment at Dacca. It is the only one in India; at Dacca the requirements of the Military and other departments, and the different sources of supply, can be brought together; the outside market can be regulated to a great extent by the granting of leases, whilst it is materially assisted by the number of surplus elephants annually sold; information can be obtained on the subject of elephants by officials

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throughout India; and elephants can be turned out for the service of Government at much less than market rates. The Government share of the elephants captured by lessees are collected and trained annually by the Dacca establishment; were it abolished, the Revenue authorities in each district where elephants are caught would require a number of trained men and elephants to take charge of the new elephants coming into their possession from lessees. Without such an establishment as that at Dacca, the recommendation of the Army Commission that Government should supply its wants from its share of lessees' captures could not be carried into effect. Since elephants have been preserved of late years for utilization, the extension of the means of turning them to account seems more desirable than the abolition of the only department where the question of elephants is understood in all its bearing.

I will now consider how economy may be effected in the maintenance of Government elephants. It is well known that the keep of an elephant is a very costly matter, averaging as it does Rs. 50, and even reaching Rs. 80, per mensem. This is due mainly to the ration of grain, either rice, paddy (unhusked rice), or wheaten flour cakes, given daily. After some experience of elephants I sometime ago came to the conclusion that a grain ration was not necessary to them for the following reasons:—

(1) The wild elephant does not obtain grain.

(2) Native timber contractors, and zemindars who keep elephants for running down and noosing wild elephants, never give any grain though their animals have severe work.

(3) Rice is a costly article, but its nutritious properties are doubtful; whilst the feeding an herbiverous animal on cooked food (wheaten cakes) is unnatural.

(4) Grain is systematically pilfered by the elephant's attendants.

I had the honor of submitting these views to Government in a pamphlet, and Government was pleased to order that the opinions of Commissariat officers in the three Presidencies should be called for. The replies received contained some diversity of opinion. Several officers warmly supported the proposal to do away with grain, others opposed it. The chief grounds taken by the latter are,—that as the domesticated elephant has work to do, whilst the wild one has not, it requires special nutriment; that it would be as reasonable to do away with the grain rations to Government horses and bullocks as that of elephants; that elephants evince great relish for their allowance; and that they would become ineffective, or as one officer expressed it "go to pieces" if they had no grain.

The opinions of those officers who approved of the measure were based on the following ground,—that the peculation of grain by atten-

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dants was so serious that, except in cases where the animals could be fed before their European officers, it amounted practically to their being *at present* without grain; that its abolition would not, therefore, be so radical a change as might be imagined; that the substitution of an abundant allowance of fodder out of a portion of the savings from grain would be beneficial both to the elephants and to the State; and that in cases where elephants had been sent out to graze, and had had no grain for lengthened periods, they did not fall off in condition or working power.

The opinions received adverse to the proposition are all theoretical. No officer has stated that the experiment of depriving elephants of their grain has been tried, and has proved prejudical. The opinions given in support of the abolition of grain are, on the other hand, based on facts; I will quote a a few examples.

Major C. McInroy, Executive Commissariat Officer, Hoonsoor, Madras Presidency, says: "I am of opinion that the grain ration might be entirely discontinued without any detriment to the elephants, always provided that the animals be properly fed otherwise; and I can testify that Captain Hunter, Sub Assistant Commissary General (now on furlough) who has probably, whilst in charge of kheddahs near Cuttack, had more practical experience of elephants than any other officer of the Madras Commissariat Department, is strongly of opinion that the ration should, if not altogether withdrawn, be reduced by at least one-half. I have had more or less to do with, on an average, some 30 elephants for the past five years, and I am very certain that those with me in camp were in the best condition on two occasions when I happened to be in jungles haunted by wild elephants; in other words, jungles where my tame ones found every sort of forage in which they delight, and to which I purposely avoided carrying grain for issue to them, being anxious to observe the results. There is no doubt that Mr. Sanderson's idea of the ultimate destination of the rice, &c., purchased for elephants, namely, its being stolen by attendants, is to a great extent correct; and were the grain ration withdrawn, a better provision for green food on a march through open country with troops might be made from a portion of the amount saved."

Colonel R. Mainwaring, Executive Commissariat Officer, Kamptee, says: "Since I have had any lengthened experience in the charge of elephants, I have always been of opinion that where plenty of tree forage is obtainable for them the rice feed is totally unnecessary; and during three years when I was at Thayetmo, two-thirds of the elephants were nearly the whole time without rice, and they were all in good condition."

Major J. Richmond,, Executive Commissariat Officer, Cannanore, says: "I am of opinion that the grain rations issued to elephants in the Madras Presidency might be discontinued, and that the saving, or a

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portion thereof, thereby gained, might be applied to increasing the allowance of green fodder with advantage to the elephants. I am of opinion that it would be advantageous to the elephant to abolish the allowance of rice, and to double the allowance of green fodder."

The Executive Commissariat Officer, Toongoo, says: "I am of opinion that, provided an ample supply of green or dry fodder is obtainable, a grain ration is unnecessary for elephants. Judging from the good working condition of elephants, the property of timber merchants in Burmah, animals that have hard usage and rough work, but in only the most exceptional cases ever receive any grain as a portion of their food, I do not consider that anything is necessary for elephants but an ample supply of green or dry fodder."

Colonel R. H. Beddome, Conservator of Forests, Madras, makes the following remarks in a report to the Madras Government on forest operations in Burmah:—

"Elephants are so abundant in Burmah that Forest officers have a fine supply of this labor, and I was surprised to find that these animals, even when in full work, are scarcely ever fed beyond the grazing they obtain for themselves. In rare instances one measure of paddy is given each evening to each animal. Our elephants (in Madras) are much pampered I am afraid, and it has always been considered necessary to give 6 or 7 large measures of rice (12 to 15 in the Commissariat) daily to each animal, besides cocoanut oil, ghee, &c., making the cost of their keep exceedingly heavy. Yet almost all our elephants come from Burmah. This question must receive the attention of all our forest officers using these animals. I have always felt certain that, in the absence of very strict supervision as to feeding, a great deal of the grain, or the amount paid for it, goes into the pockets of the mahouts or fouzdars. I have myself detected glaring instances of this, when elephants have received no grain for many days, though it has been paid for."

These opinions are of practical value, and I can supplement them by my own experience on a large scale. In January and February 1876 I kept 50 elephants engaged in kheddah operations in Chittagong without any grain. During that time they marched several hundreds of miles, carrying loads and escorting and supplying with fodder 85 newly-caught animals, in hilly and difficult country. They did not suffer in any way from being deprived of grain. In Mysore I kept many elephants permanently without grain. The Nawab of Dacca keeps his elephants on fodder alone. For the past 18 months a daily average of upwards of 200 kheddah elephants at Dacca have been entirely without grain, and Rs. 30,000 a year is being saved thereby. The grain ration at Dacca only costs Rs. 11 per mensem per elephant; in many stations in India it is upwards of Rs. 40.

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The work of the kheddah department elephants at Dacca is more arduous and continuous than that of any other elephants I know of in India. They are employed from sunrise till sunset all the year round, either in carrying stores with the hunting parties: in dealing with newly caught elephants; or in supplying them with fodder. They maintain their health and condition on green food alone.

In few Commissariat stations in India have elephants any thing to do for the major portion of the year but to bring in their fodder. Many are even supplied with purchased fodder at their pickets. It cannot be imagined that an allowance of grain which, though small in comparison to the capacity of the elephant, is a costly item to Government, is essential to the existence of animals thus doing nothing.

The eagerness with which an elephant looks for its allowance is no greater proof of its necessity than the relish evinced by a horse for its accustomed morsel of bread; both may be regarded purely as delicacies.

Regarding the loss to Government by the pecculation of grain little need be said. When elephants are transferred from one station to another, sometimes a two months' march, during which the jemadar or senior mahout has the control of, frequently, hundreds of rupees, for the expenditure of which bazar receipts, obtainable at all regular halting stations for a rupee or two, are the only vouchers, it may be doubted whether a single rupee is expended on grain.

When the elephant can be fed before its European officer, then, and then only, does it obtain its full allowance. But how seldom is this the case. No large number of elephants can be maintained for many months together at any Commissariat station. With the changing season they are sent to places where fodder is procurable, and are then beyond the control of either European officer or serjeant. It is a well-known fact that others than the elephants' immediate attendants commonly have their recognised share of the proceeds of systematic plunder.

In addition to the practical proofs I have already given that elephants can be, and are, worked on green food alone, theory also favors the abolition of grain. An elephant's work is always slow. A horse in fast work requires concentrated food, because, were he distended with grass, the action of the organs of respiration would be interfered with. But the amount of grain given to elephants as compared with the quantity of fodder they consume bears no proportion to the amount of grain given to horses. The average omnibus horse receives 14lbs. of hay and 18lbs. of corn, daily. The grain is here 128 per cent. on the fodder. The elephants grain ration in Bengal is but 4 per cent., and in Madras 10 per cent., of its green food. Moreover in many parts of the world horses receive no grain, as in the Bush in Australia, in Mexico, and amongst the North American Indians. The fact of the necessity of grain to horses performing special kinds of work cannot, I think, be

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accepted as an argument when considering the requirements of an animal so differently constituted as is the elephant.

It may be said that the rules for feeding Commissariat elephants must have been based on their ascertained requirements. But the various scales in force in the three Presidencies, not only as regards grain and fodder, but the weights which elephants are supposed to carry, preclude the belief that much was known on the subject when the scales were fixed. The elephant is essentially a native's animal; its capture, training, and management are in native hands; very few Europeans have ever had any practical knowledge of elephants, and there seems no reason to suppose that, when the present scales of feeding and loading were fixed, long ago, more was known of them by Europeans than is known at present. I will point to various discrepancies in the Commissariat Codes of the three Presidencies to support my statements, premising that elephants differ in no respect in Bengal or Madras. Regarding loading, the Bengal Commissariat Code says: "Capability of carriage, exclusive of gear, 1,640lbs. The Bombay Code says: "The weight to be carried by an elephant is restricted to 1,200lbs. The Madras Code says: "To carry 738lbs.; a few carry 861lbs." Thus 50 elephants in Bengal are excepted to do the work of 95 in Madras. No difference in the physical nature of different parts of India can account for such a difference in loads.

As regards feeding, irreconcileable differences exist. In Bengal an elephant receives 400lbs. of green fodder; in Bombay 340lbs.; in Madras 250lbs. If dry fodder be given the Bengal elephant receives 250lbs., the Madras elephant 125lbs., or one-half. It is evident that either the Bengal elephants are overfed, or those of Madras are underfed. This point will be considered presently.

Whilst disparity exists in the matter of capability of carriage, one in which it is so easy to test an elephant's powers; and regarding its requirements in fodder, which can be settled by observation; is it beyond question that the grain allowances are exactly what are required by elephants,—that they have been ascertained to be the exact equivalent necessitated by lack of natural food; or as supplying the (supposed) aliment necessary to enable the elephant to undergo the work imposed on it in a state of domestication? Let us first examine the scale of grain allowed in the three Presidencies.

In Bengal an ordinary elephant receives 9 seers of unhusked rice, or 9 seers of wheaten flour, daily; in Bombay the allowance is greater; in Madras the ration consists of 12½ seers of cleaned rice. As the 9 seers of paddy given in Bengal contain 6¼ seers of cleaned rice, the Madras grain allowance of 12½ seers of rice is exactly double that of Bengal, whilst the fodder allowance is exactly half. It cannot be believed that a few handfuls of grain can make any difference in the food of an animal that consumes such large quantities of fodder as does the

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elephant, or that 6¼ seers of rice compensates the Madras elephant for the 150lbs. of fodder he receives less than his brother of Bengal. Elephants are frequently imported into Bengal and into Madras from Burmah. If drafted to Bengal, an elephant has at present to carry double the Madras load, whilst it receives twice as much green food, and only half as much grain, as it would were it to go to Madras. The anomaly is not more remarkable than would be the case were engines of equal power on the Madras and Bengal railways to differ to the extent of 50 per cent. in their work, whilst the one should be allowed twice as much coal, but only half as much water, as the other.

With the recommendation for abolishing grain, the condition that the animals should have a proper supply of fodder is naturally connected. This should, of course, always be the case whether grain be given or not. I consider that the Bengal allowance of 400lbs. of green, or 250lbs. of dry, fodder, if it be good, is a sufficient one for ordinary elephants, and that the Bombay and Madras scales should be brought up to the Bengal standard. The feeding of elephants would then be equalized throughout India.

In proposing to abolish grain, the fact that elephants' attendants have hitherto looked to obtaining some of it as a perquisite cannot be omitted from consideration. A certain class of men is now obtained for the inducement of pay and perquisites, and it would be unwise to reduce their emoluments, illicit though they be, so far as to lower the class of attendants. I would, therefore, propose that an allowance of the Re. 1 each per mensem for mahouts and grass cutters be given, to be called "Condition money," to be treated as separate from pay, and only to be given if due care be taken of their animals. Rs. 2 each per mensem might further be provided on the same terms for jemadars and senior mahouts in charge of elephants.

The saving effected to Government by the abolition of grain to 1,307 Commissariat, and 300 elephants of other departments, throughout India would amount to Rs. 4,38,000. The accompanying table shows the cost of the grain ration, and in most cases of the fodder, of elephants in Commissariat stations throughout India. From the above sum (Rs. 4,38,000), Rs. 56,000 is to be deducted for bringing the Bombay and Madras fodder scales up to the Bengal standard, and for the proposed increase of pay of attendants. The total annual saving upon 1,607 elephants would therefore be 3,62,000. Should the Commissariat elephants be reduced by 900, the saving would still amount to 1,58,400 per annum.

I may say that in Frontier stations in India, where free jungle fodder is cut by the attendants, at least double the weight of purchased fodder, or 800lbs, should be supplied daily to each elephant, as there is more waste and less nutriment in the average jungle fodder than in stalks of grain, sugarcane, &c.

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I have been asked what I would propose to feed elephants on if grain be done away with when on service in countries where fodder is scarce. In reply I would say that elephants cannot be taken where they cannot get fodder, and that a few seers of grain will not compensate them for a deficiency of their natural food. I am not aware, however, that any locality to which elephants have been taken has been found to be so inhospitable to them. They reached Magdala, and have recently worked well in Afghanistan. An artillery officer who had a portion of those with the Khaiber column under his command recently, informs me that green barley, kurbee or jouar, and surgarcane were daily obtained for them in abundance.

I will now consider the question of carrying elephants by rail. The ability to transfer these animals rapidly to different parts of India would greatly increase their value as means of transport, and probably considerable economy might be effected in their maintenance by ordinarily keeping them at places where fodder is plentiful. Elephants at most stations cost Re. 1 per diem for fodder alone; there are many places within reach of lines of rail where they might obtain jungle fodder for nothing. Elephants connot conveniently march more than 300 miles a month; consequently they cannot, under existing circumstances, be quickly concentrated. The Army Commission has stated in its report:—"It is practically impossible to move elephants by rail from one part of India to another." This must, I think, have been written before the results of certain experiments that were made in 1879 on the East Indian Railway, in the matter of carrying elephants, were published, as they conclusively demonstrate the reverse.

These experiments were conducted by Captain H. Wilberforce Clarke R.E., Officiating Deputy Consulting Engineer for Guaranteed Railways, other officers attending the trials. Major Kinloch, Deputy Assistant Quarter Master General, reported as follows on the subject:—"It has been found perfectly practicable to convey elephants in ordinary cattle trucks; there was absolutely no risk even when the elephant was startled by the whistle of engines purposely sounded quite close. The truck was taken under bridges, started and stopped abruptly, and in fact subjected to every test that could be thought of. Once secured an elephant is absolutely powerless to injure either himself or the wagon."

Another experiment consisted of conveying an elephant 73 miles at a speed of 28 miles an hour. Regarding this trial Captain Clarke remarks: "It was entirely successful." The elephant was secured in an open cattle truck fitted with cross beams on each side of, and behind, the animal, to steady it. Captain Clark says: "40 wagons could be fitted up in 10 days to carry elephants. There are on the East Indian Railway 53 cattle wagons and 106 coke wagons which could be easily converted into elephant wagons. The elephant's clothing and all his

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gear can go with him, and a certain amount of fodder. As regards undue oscillation of the elephant wagon, on account of the height of the centre of gravity of the live load above the floor, no apprehension need be entertained. The dead weight of the wagon and fittings is 6 tons, 18cwts., 3qrs., that of the elephant under 2½ tons. The actual live load compared with the dead load is in this case very small. When the wagon carries 10 tons of grass, as it safely may, the centre of gravity would then be as high as in the case of the elephant, while the load carried, instead of being less, would greatly exceed the dead weight of the wagon. 32 elephants can be carried in one train within the regular goods-train weight of 400 tons."

When these experiments were first begun the elephant's forefeet were secured by four chains running to the four corners of the wagon; but this arrangement was found to allow the animal too much play. Its fore and hind feet were then shackled together in pairs, and the shackles were passed through ring bolts in the floor, between each pair of feet. This answered perfectly. Captain Clarke suggests a covering overhead to protect the elephant from the sun, and to prevent him seeing bridges, &c. But there is no necessity for this, I think, as even when travelling during the day the elephant would not be more exposed than he usually is at work, or at picket; whilst it would be imperatively necessary to secure him before starting in a manner that should exclude from consideration his feelings at strange sights; thus the covering would be unnecessary as a screen for this purpose. Fodder can be provided for the animals in their trucks, and water be given morning and evening. There need be no difficulty in getting them into the trucks with proper arrangements. The 4 beams forming the fittings for cattle wagons when used to convey elephants might be kept in readiness at the railway stores. In this way elephants might be as expeditiously concentrated at any point as troops.

I now come to the consideration of gear for elephants. An elephant's gear at present consists of a *gaddela* or quilted cloth an inch and a half in thickness, reaching half way down his sides, and from the nape of his neck to his croup. On this is placed the guddee or pad, about 6 feet long, 5 feet broad, and 9" thick, formed of stout sacking, stuffed with dried grass. In some parts of India another pad is placed on the top of this. The whole is girthed on with a long rope, which is passed twice round the body, round the neck as a breast-strap, and under the tail as a crupper. This gear, complete, averages 200lbs. in weight.

This equipment is very ineffective for the following reasons,—1stly, the load rests to a great extent on the spine, the consequence being that very few elephants escape sore backs, especially when on active service. 2ndly, the pad has to be tied on very tightly at first, as when the load is placed on it the girthing becomes slack; the animal is consequently galled by the tightness of the breast-strap and crupper,

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and in climbing hills its respiration is interfered with by the neckrope. 3rdly, in steep ground the pad constantly moves backward and forwards, and the ropes cannot be re-tightened without removing the load; 4thly, the centre of gravity of the load is so high that it is easily upset: an elephant frequently has to hitch its load to one side or the other to keep it properly balanced. 5thly, the whole arrangement is cumbersome; should it get wet its weight is almost doubled; whilst the guddee, or padded cloth retains the sweat, and keeps the animal's back hot and moist, which favors galling.

The small share of attention that elephants have hitherto received is well shown in this unscientific equipment, which is the same as it was a hundred years ago. The difficulty of making anything in the shape of a saddle tree strong enough to bear an elephant's load, without being cumbersome and heavy is, of course, considerable, and this no doubt has been one great reason of no improvements having been effected. Gun battery elephants are furnished with a kind of saddle, but it is by no means a perfect arrangement.

I have recently invented a saddle for baggage elephants which, I think, removes the objections to the pad. It consists of two pads or pillows entirely detached, each 4 feet long, 15 inches wide, and 6 inches thick. These are made of blanket, covered with waterproof tarpaulin, and encased in stout sacking. One is placed on each side of the elephant's spine, and they are retained there by two connecting arches of T iron. No saddle cloth is required underneath, and the spine is left entirely free along its whole length, and for a width of 15 inches, for the circulation of air. The load rests entirely on the upper part of the ribs. The breast-strap and crupper hook into rings on the saddle, and do not come into play except in steep ground. The girth hooks on to the saddle on the off side, and is drawn tight on the near side, by a piece of rope 6 feet long. The girth, breast-strap, and crupper, can be tightened without removing the animal's load. The saddle is fitted with numerous rings for fastening ropes to. Its weight complete is 140lbs., which is a saving of 60lbs. per elephant over the old gear, or, if the loads be 1,200lbs., of one elephant's labor in 20. The saving in weight is much greater in wet weather, as the new saddle pads cannot become wet. The old pad was balanced, as it were, on the spine, and a little extra weight on either side caused the load to incline accordingly; but in the new saddle, owing to the broadness of its base, 200lbs. may be placed on one side of the centre without any counter-balancing weight, without effecting the equilibrium. The stability of the new saddle is such that I have loaded an elephant with 1,200lbs., and marched it on level ground for miles without either girths, breast-strap, or crupper being attached, without the saddle shifting. It is especially adapted for hilly country. With foot boards attached it is convenient for riding. I have also, however, introduced a special chár-jama, or riding saddle, that leaves the elephant's spine entirely free, from pressure; it seats 4 people comfortably; has large leather wallets

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for clothes and odds and ends; and weighs 120lbs. The only thing that remains to complete the new baggage saddle is, to have a cradle made that can be fitted to it for the conveyance of guns, mortars, and their carriages, and this I think can be easily managed.

The weight which an average elephant can carry depends of course on the nature of the country, and on the continuity of the exertion required. In the Abyssinian Expedition elephants travelled many hundreds of miles over a mountainous country, carrying loads of from 1,500 to 1,800lbs. (including their gear). Out of 44, two died from exhaustion, and three from want of water, after the fall of Magdala. On occasions a strong elephant may be loaded with a ton, including gear, but for continuous marching 1,200lbs. or 15 maunds, exclusive of gear, is a sufficient load. This equals 3 camels' loads of 5 maunds, or 7½ mules or ponies loads of 2 maunds each. Elephants are capable of great exertions on occasions, such as working from morning till night, and of remaining under their loads for 20 hours at a stretch.

The proper management of the elephants attached to the Military and other departments in India is a subject of much importance, both financially, and from a humane point of view. It is, however, unfortunately a matter but little understood by the European officers of the various departments, who are almost entirely dependent upon their elephants' attendants. These men are generally grossly ignorant and superstitious, and they view with horror any departure from the traditional management of their charges, however beneficial it may be.

A few general remarks on the subject of improving the management of elephants may be of use to some who have charge of these animals, but have not had opportunities of familiarising themselves with their requirements. In the first place it must be borne in mind that mahouts will invariably, if allowed, make their elephants' comfort and convenience subservient to their own. Though they are rarely wantonly cruel to their charges, they subject them to much passive inhumanity which a little supervision from those over them might prevent. For example, on days when the elephants are not required for work, the mahouts and grass-cutters will, if left to themselves, cook, smoke, and pass the time till nearly mid-day without loosing their elephants except to take them to water. They should be required to hobble them early, and to turn them out to graze and stretch their limbs till wanted; but as this would give them the trouble of going in search of them if they strayed, they will not do it of their own accord. When there are fields near, one attendant can accompany each elephant to prevent it doing damage. Then, instead of cutting its fodder early, and taking the elephant out to bring in its load in the cool hours of morning or evening, the attendants, who do not mind the hot sun themselves, often take it at mid-day, as that arrangement suits their hours of breakfasting, &c. Even the best mahouts, extraordinary though it may seem, seldom take the trouble of putting their elephants under a tree at mid-day.

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If there be one thing of which a mahout has a greater horror than another, it is to see his elephant throwing dust and litter upon its back to shield itself from the heat, or for passtime. As he sits in the shade, enjoying his hubblebubble, he abuses the animal roundly if it resorts to this amusement; even though he slumbers he always keeps one eye open to watch for this flagrant misconduct on the part of the elephant. The only harm done by it is that a few holes may be made about its picket, and that the mahout will have the trouble of dusting the animal afterwards.

Then, mahouts are very fond of securing their elephants both fore and aft in a most irksome manner, though a rope or chain fastened to one foot and to a peg in the ground is sufficient restraint for most elephants. This latter mode of fastening allows them to turn to, or from, the sun or wind, as they find agreeable. Natives think nothing of securing an elephant so that one side is exposed day and night for weeks together to wind and rain.

As a rule the chains with which elephants are secured are of various patterns and sizes; either the links are so thick that only a very thin hook can be inserted into them, and their strength is thereby rendered unavailing; or they are so thin that if elephants are alarmed during a storm, or by a fire in a village near, they snap them and make off. A large quantity of chain has recently been imported from England for the Commissariat Department of a size of link specially adapted for the purpose of elephant fetters; and Commissariat officers and others may obtain complete sets of elephant fetters of the best patterns from the Dacca Depôt.

The chief fodder of elephants should consist of various kinds of grasses, which in India grow to a considerable length and thickness in swamps and damp places. But where these cannot be procured, or too often owing to the laziness of the grass-cutters, who find lopping branches easier work than cutting grass, elephants are almost entirely restricted to leaves and branches of trees. This is not a natural diet; wild elephants eat but sparingly of tree fodder. However, tame elephants become accustomed to it, and in many parts of India hardly any thing else is procurable. Branches are not relished when the sap is running. The various kinds of *ficus* which form the chief tree fodder given to elephants are in the best condition as food when the twigs snap, rather then bend, under pressure. Elephants thrive exceedingly well on jouar or kirbee stems; on green or even dry wheat, barley, and other straws; and on the inferior kinds of sugar cane.

It is commonly believed that the elephant is a delicate animal, but I think the very reserve is the case. When the entire revolution that takes place in his habits upon being taken from the wild state, be taken into consideration, it is rather a matter for wonder that so few elephants die, than that casualties frequently occur amongst them. The

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wild elephant roams many miles during the night in search of food, and sleeps and rests during the hot hours of the day. In captivity he is secured, often in an irksome position all night, and is worked under a hot sun when he would fain be sleeping. He is systematically underfed by his attendants, and after long periods of comparative idleness, he may be called upon for severe exertion on active service. He is taken from the moist heat of the jungles of Eastern Bengal, and is exposed to the intensely dry heat, and severe cold, of Upper India. With all this, the casualties in the Commissariat Department, excluding newly caught elephants at Dacca and Barrackpore, are under 5 per cent.,—except in times of service.

The most common ailment amongst elephants is zaarba'hd. It is of two kinds, one called dropsical zaarba'hd, in which the neck, chest, abdomen, and sometimes the legs, swell with accumulations of water beneath the skin; the other is wasting zaarba'hd in which the animal falls gradually away to mere skin and bone. Both kinds are exceedingly fatal if they become established. They are most common amongst newly caught elephants, and are induced by the radical change in food and habits undergone by them. But whether they appear in newly caught, or in old, debilitated elephants, medicine should not be trusted to. Freedom from unnecessary restraint; liberty to graze at will, or if that be impossible, a thorough change of food from dry to green. or *vice versa* according to what the animal has been having when the disease appeared; and protection from all debilitating causes, such as exposure to the sun or inclement weather; are the best preventives and restoratives.

Sore backs from the chafing of gear are exceedingly tedious to cure. The mistake usually made by mahouts is to allow the wounds to heal on the surface whilst mischief is going on inside. A free use of the knife, great care in cleansing the wound, and the application of plenty of turpentine, strongly impregnated with camphor, is the best treatment. The wounds should be well stuffed with soft rags steeped in the camphorated turpentine; this prevents them closing up too quickly.

In elephant management the chief point to be seen to is that the animals get plenty to eat. They will then rarely be on the sick list from any cause. Underfed elephants become weak and unable to stand exposure, and are laid open to attacks by even such remote maladies as sunstroke and sore back, by poor condition. It is common enough to see elephants in poor condition suffering from nothing but partial starvation, being treated with medicines and nostrums for debility, whilst their appetites are good and they only require a sufficiency of fodder to effect a cure. The elephant, in common with all wild animals, goes to no excess in any of its habits; and there is no reason why the present rate of mortality in domestication should not be reduced by attention. No domestic animal responds more quickly to care and good feeding than does the elephant.

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At the conclusion of the lecture Sir Robert Egerton invited comments upon it.

Colonel Willes, Commissary General, said he should like to make a few remarks on some of the points raised by Mr. Sanderson. In the first place Mr. Sanderson argued that elephants were over-fed, or rather did not require more food, and he argued particularly that grain to elephants was unnecessary, and recommended its abolition. Now he (Colonel Willes) had had some experience in the matter, having been for over 30 years in charge of elephants, during the last twelve of which he had had the whole of the Transport Department under him. Mr. Sanderson had quoted the opinions of certain officers in favour of his recommendations to abolish grain; but there were other and very experienced officers whose opinions were directly at variance to those quoted by Mr. Sanderson; such for instance as Colonel Macbean and Sir G. Yule, the latter of the Bengal Civil Service who kept elephants for many years, and who had always held that Government elephants were not sufficiently well fed. Colonel W. contended that to do away with the grain without increasing the ration of fodder, while economical, would not be desirable, and could only be done at the risk of the elephants suffering in condition and efficiency; that he believed that all Government elephants were underfed. They got a certain quantity of fodder, often of a poor unnutritious kind; and it was only the grain added to this which helped to keep them in condition. He had no doubt that it would be equally beneficial if additional fodder of good quality were given, but Government would not allow this: but if the grain were withdrawn he would certainly urge that better fodder should be given instead, though without going into the economy of the thing he thought that grain would be the cheaper of the two.

As regards the cost of elephants, Mr. Sanderson had stated that Rs. 2,000 was the normal price of an elephant, but his experience was that suitable animals were obtainable at much lower prices at Sonepore and other fairs. Hearing that Mr. Sanderson was about to give them the benefit of his experience regarding the elephant, he telegraphed yesterday to Naga to inquire what had been the mortality in the present campaign, and he was informed in reply that 110 elephants had died out of the whole number engaged; many of which were very fine animals and had been sent up by Mr. Sanderson himself from the kheddahs. In fact those very elephants which Mr. Sanderson told them had no grain at all were so weakened and reduced on their arrival that the officers in charge telegraphed to be allowed to put them on grain at once as the only means of bringing them into condition. Permission was given to do this: but it was a remarkable fact, Colonel Willes thought, that in their own habitât, where they got abundance of the fodder on which they lived in their wild state, the elephants should have suffered extremely, so much so that he had heard yesterday that 45 of the hired animals had died, & the extravagant claim of from two to three thousand rupees each was preferred. He could not, therefore,

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understand with reference to this great mortality, on what grounds the elephant could be regarded as an economical animal to use in war. One would fancy that the elephant would do good service and thrive well in its own climate, but as a matter of fact the late Naga Campaign was not the only one which proved the contrary. In the Bhootan campaign the fodder was abundant; the work certainly was heavy, and much of it was done in the hills and the elephants acquitted themselves well; but at the same time over 200 animals died; they suffered far more than they did on the North Western frontiers, especially in Kabul and other countries which were not their natural climate, and where fodder was extremely scarce. Still they died in much smaller proportions in those places than in Assam and other parts where the climate one would expect should suit them, and where fodder in unlimited quantities was obtainable.

Colonel Willes contended that if they could not stand such work they were a most expensive description of transport, but still in those parts a necessity, as no other animals could work in those districts. It was a case of elephants and boats. He argued that far from being economical the elephant, except for state and mililtary purposes, that was for dragging or carrying guns, was not only expensive but unnecessary; unnecessary because the railway now carried all heavy baggage, and the large cumbersome tents used for Europeans, for which elephant carriage had been kept hitherto, were not likely to be used on field service any longer, though some for standing camps would always be required, and these could be moved in carts. He therefore thought that the establishment of elephants could be very greatly reduced and a very large saving effected. Mr. Sanderson had told them that the cost of keeping an elephant was now about Rs.50. His experience on the contrary was that the cost was nearly three times as much. During this war, the cost of an elephant beyond the frontiers was probably now nearer Rs.150 than Rs.50, and for years past had probably not been less than Rs.60 in many parts of India, for which 12 or 14 camels could be kept, and the elephant only carried a load of 3 camels. So difficult, indeed, had it been found to feed elephants beyond the frontier and at Kabul, that he thought he was right in saying that they had been withdrawn to the fullest extent possible. It was a remakable fact, too, that elephants on their first capture did not die to any extent, but in the course of a few months, when they got to Barrackpore, they died in large numbers, and there it was well known the climate was suited to them, and fodder was abundant.

Colonel Willes contended that the moving of elephants by rail had not been a success. The experiment to which Mr. Sanderson referred was, he believed, carried out with only two or three animals. He also thought that it would be impossible to carry elephants in the common wagon described by Mr. Sanderson, even though the animals were secured: he was sure that if an elephant, which was a very timid creature, once got frightened, he would upset any wagon, and this was

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the opinion of the late Lord Mayo who had, with Colonel Willes, discussed the subject. Mr. Sanderson also argued that if the movement of elephants by rail became possible, then they could be kept in places suitable to them and the mortality would be greatly reduced, and they could be sent long distances for employment on service, say from Bengal to the Punjab frontiers, and that wherever kept, Government would require a corresponding decrease in carriage for the troops. Colonel Willes was sure that the Government would not consent that a moveable column at, say, Lucknow, should have its transport kept at Barrackpore, to be sent up if wanted; and yet if this were not done camels or other carriage would have to be kept at Lucknow at extra expense.

In conclusion Colonel Willes remarked that, having been as already stated, 30 years in charge of elephants directly or indirectly, he had no hesitation in advancing his opinions though opposed to those put forward by Mr. Sanderson, who he admitted had himself great experience in regard to elephants, and to whom, as Commissary General, he was greatly indebted for his services as a most successful elephant catcher.

Mr. Sanderson replied that, as to the question of mortality referred to by Colonel Willes as having taken place in the Naga Hill Campaign, he could not understand how 110 elephants could have died, as he had only sent 80 there altogether; first 50 in November, and afterwards 30 in March.

Colonel Willes remarked that the number given by him included the elephants taken from Tea Planters and others.

Mr. Sanderson did not see that what had been advanced by Colonel Willes to show that the elephants had not got on well in a country which was their own habitât had any bearing on the question of the abolition of grain. With regard to the opinions of other officers which were opposed to his own views, he should be very sorry to suppress them if they contained any fact which he could bring forward; but as he had already stated in the course of his lecture, the opinions of these officers were merely theoretical. Colonel Macbean for instance, said that whenever he found elephants in bad condition he ordered them a seer of grain additional, when they immediately came into good condition. Now he, Mr. Sanderson, scarcely thought that the fact of giving an elephant a seer of rice over its ordinary quantity would make such a material difference; were such the case, it would be very easy to keep elephants in good condition.

Mr. Sanderson argued that elephants had been found by native proprietors to thrive and work satisfactorily without grain at all. He reiterated his statement that no one officer opposed to the abolition of grain had asserted that the abolition had ever been tried and had failed. (hear hear). The opinions advanced by those gentlemen were simply

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theoretical and opposed to those acquired by practical experience, and were not, he thought, entitled to the same consideration, (hear hear). Then with reference to the conveyance of elephants by rail, he could only say that Captain Wilberforce Clark and Major Kinloch had made the experiment already described by him, and had reported it as perfectly practicable, and as having thoroughly succeeded. He (Mr. Sanderson) did not desire to urge his own individual opinions on those points, but was content to state the views which had been the outcome of practical experience; and he was sure that even Colonel Willes would admit that the views which he had put forward had no such ground for their support.

After some further discussion as to the employment of elephants for the carriage of guns, Captain Collen said,—I shall like to ask Mr. Sanderson a question. He has stated that the Army Commission has recommended the abolition of the Khedda Establishment. What I should like to know is, whether in Mr. Sanderson's opinion the establishment could not be made a source of revenue to the State. There is a large demand by other departments of State and by the public, and it would be desirable to ascertain whether the elephant kheddas could not be made an actual source of revenue instead of expenditure.

Mr. Sanderson replied that elephants could certainly be made a source of revenue by Government holding the trade in its own hands, of course not interfering with those who had established rights at present. The jungles could be kept closed, and the market price raised, and thus a considerable revenue could be realised. On the other hand, by throwing the jungles open to natives, Government benefitted in this way, that the market would always be well stocked, and should Government ever require a large number of elephants, it would be able to get them at a very low price. At present they were scarcely obtainable at any price. Then again wild elephants were increasing, and pressing on cultivation in many quarters to an extent which would require some measures to be taken for keeping them within bounds. By throwing open the jungles to native hunters, under due restrictions for preventing waste of elephant life, this would be effected.

If Government decided on reducing the number of its Commissariat elephants to 400, it might never require to go into the market to buy largely. In that case it would be a loser by free trade, except in so far as the country was benefitted generally in the trade of elephants.

Sir Robert Egerton in returning thanks to Mr. Sanderson, said that he was sure the meeting was sorry that they had heard the last of Mr. Sanderson's discourses on the elephant. They had all of them listened to them with very lively interest and pleasure, and had, apart from this, gained much instruction. It was satisfactory to know that there was not much chance of the race of elephants becoming extinct in India, and that notwithstanding the extension of railroads and other means of

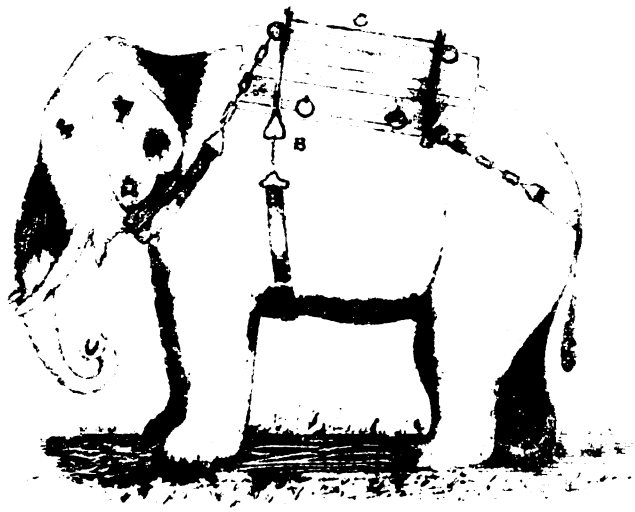
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communication, the elephant still continued to be employed for those uses in which it had been so long, in fact from time immemorial, employed in this country. He thought that the subject of the conveyance of elephants by railroad had not yet been sufficiently investigated. The report of Captain Wilberforce Clarke, which he had read with much interest, seemed to show that it required a good many trials to arrive at anything like a satisfactory method of loading and carrying the elephant in a railway truck; but when the method had once been discovered it appeared to him that, by trained establishments and by continual practice, both in loading and unloading elephants from railway trains, the question might be brought to a satisfactory and practical conclusion. He thought there could be no doubt that it was most important in view of the number of elephants required to be kept for military and other purposes, that the possibility of conveying them by railway trains should be satisfactorily settled; and there was also no doubt, he thought, that the stock could be considerably reduced if it was found praticable to concentrate at any points to which the railways might extend.

He was sure that all present would join him in cordialiy thanking Mr. Sanderson for having given them the advantage of his unrivalled experience with regard to the capture, treatment, and management of the elephant in India. He had told them a great deal which they did not know before, and he was sure that all they had now heard would greatly add to the interest they took in an animal which occupied such a prominent and important position in this country.

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ELEPHANT WITH SADDLE



The girth hooks on to chain on off side as shewn at A. in plan, and is drawn tight by a short rope on near side at B. Two iron bars (C C. in plan, prevent load touching spine. D (in cross elevation) shews open space above spine. The pads are 4 long. 3 broad, and 6 thick formed of layers of Meerut blanket. weight of pad 60 lbs. iron frame 80= 140 lbs.

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III.

THE "COLLINSIAN" 2ND PRIZE ESSAY.

GOOD AND BAD STABLE MANAGEMENT WITH ITS RESULTS.

INDIGESTION ITS CAUSES AND THE BEST MEANS OF PREVENTING IT.

BY.

VETERINARY SURGEON A. E. QUERIPEL.

PART I.

The Suject of this paper being of such importance to every body connected in any way with horses, will at once lead them to consider the magnitude and scope of the matters contained under these two headings. But if of importance to persons connected with horses only as a matter of pleasure and recreation, how infinitely more impressed should we, in the mounted branches of the service, feel when contemplating the number of cases which could be avoided during the year, were judicious stable management in force and proper attention paid to diet. Let us examine the Registers and ask ourselves carefully the cause of each individual entry therein recorded, and I feel certain that we shall find a large percentage owing their origin to some faulty management either in or out of the Stable, not that I would for one moment assert that it lies in our power to predict that a certain accident or disease would arise from any cause which may have been instrumental in bringing it about, but I maintain that once having had one's attention brought to a a subject by the occurrence of an accident etc. it becomes our duty to endeavour to so far remedy it as to render it next to an impossibility that a similar disease or accident should arise again from a like cause. In speaking as I have done, let it not be understood that I am alluding only, to cases such as kicks or other accidents or to diseases arising from derangement of the functions of the Stomach or intestines, for altho' these two subjects will necessarily occupy the most prominent position in this paper, still there are other diseases which arising from Indigestion or from faulty management in the way of feeding, tend greatly to increase the percentage of sick during the year. I allude to dietetic diseases in general.

Diseases of the kidneys are in many instances induced by faulty diet diseases of the liver likewise owe their origin in a great measure, either to the same cause or to bad stable management, whilst diseases

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of the skin are in many instances preventible, certainly by attention to cleanliness that class due to parasitical affection, and if that portion which can be traced to constitutional causes is not actually under our control, to prevent by careful attention to diet, still we all know how greatly we can assist nature and relieve our patient, by giving him such food as will render him less liable to these affections which prove so troublesome in India. It only now remains for me to point out that that class of diseases known as epizootic are greatly influenced by diet.

Diseases of an anthracoid nature which in this country so frequently prevail, are greatly influenced by food in an outbreak of "Loodianah or Malignant Fever" the horses that are the fattest are generally first attacked, but on the contrary, bad innutritious forage will also render horses liable to this fatal malady. We are also aware of the influence which a bad or scanty supply of forage has in predisposing horses to Farcy, in fact horses in a low debilitated condition seem particularly adapted for the developement of the disease.

Broken wind, an ailment fortunately less prevalent in India than in England, is traceable in many instances and is always alleviated by careful diet. Even Tetanus has been known to be caused by coarse food. I have enumerated some of the most common diseases which have their origin either in faulty digestion or bad feeding, to impress upon my readers the fact that, Food and the mode of giving it, is a subject which cannot be too highly considered, let it be either by professional a non-professional men. Were it not for the deaths arising from this cause our death rate would be reduced to a minimun.

Hygiene and food are so closely allied in the management of horses, that it is difficult to separate the two, for of what value is good food provided sanitation in general and ventilation especially, are not attended to? The diseases to which food and water give their origin constitute a very large class. They may be induced either by an execess or diminished quantity, by the article possessing too highly nutritious properties or on the contrary by not containing those elements which are necessary for the maintenance of the various components parts of the animal body or by containing within themselves some ingredient which when absorbed into the blood either gives rise to its putrefaction as in cases of Anthrax, or interferes in some way with the process of nutrition.

The various constituents of food and water together with their effects will however have to be more closely studied, both chemically and microscopically, when treating on these subjects.

I have hitherto but alluded to the consequences of injudicious or bad feeding, it only remains for me to point out the necessity of good stable management, and I feel certain that but few words will suffice, as it is a recognized fact and one apparent to every body that to this, a

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horse owes his health and usefulness. Let the quality of his food be ever so good, provided he is not well groomed or carefully exercised, we know that it renders him unfit on many occasions for work. Who has not seen the hunter in the hunting field at the commencement of the season, quite distressed early in the day, without asking himself the cause? It is due to bad stable management. Had that horse been properly treated and exercised during the summer months, this would not have been the case, but on the contrary he has in all probability been left "to rest himself" in a box and has been irregularly exercised, and the groom thinking that as the horse is doing but little work, pays but little attention to grooming. Every horse owner knows how annoying are the various accidents to which a horse is liable in a stable, and if annoying to a person who keeps his horses simply for pleasure, how immeasureably more so, must it be to an officer commanding a Regiment or Battery when on his horses' soundness, depends, especially on service, his power to move his Corps.

Having now made a few introductory remarks I shall proceed first to speak of Stable management in detail, pointing out what seem to be the most popular errors committed in India and then shall pass on to speak of watering and feeding, a subject which will engross much attention—and having done so I shall enumerate the diseases and accidents arising from these two causes, the means we possess to diagnose them and the treatment to which they most readily yield.

Stable Management.

STABLE MANAGEMENT. We must first notice the construction of Stables. As this is of primary importance I shall give a slight outline of the various points which should be considered in building or selecting a site for stables. The management of horses may be ever so perfect, but if the building is either of faulty construction or the situation is badly chosen health cannot be maintained.

Selection of site for stable.

In selecting a site for the building of permanent stables, a difference must be drawn between this and selecting one which is only to be employed as a temporary measure, for whilst one of the main points to be considered in the latter case, is the question whether water is to be obtained close at hand, on the contrary however in the former case, if good water exists in the vicinity, it can be brought at little cost to the stables.

Space.

The main point seems to be the question of space and to this I would direct especial attention. No one will deny and statistics will clearly prove that the amount of sickness and rate of mortality is much higher in towns than in rural districts and from this we can argue that building stables too close together and thereby diminishing the quantity of pure air, will always prove prejudicial to the health of horses. In erecting stables running parallel to each other I would recommend that at least

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100 yards be allowed to intervene between each, in those ranging from 40 to 70 yards distant, diseases which depend on the atmosphere being impregnated with organic emanations are frequently prevalent in an enzootic form. Another objection to a restricted space is that buildings such as Barracks, placed as they must necessarily be in the most healthy situations, are generally built to windward of the stable, thereby entirely blocking them in and preventing the ingress of air, whilst other buildings, such as harness rooms &c. prevent its egress. These points I look upon as being frequently the cause of sickness amongst the Troop Horses in this country.

Soil.

The next point worthy of consideration must be the geological formation of the soil and the facilities with which it can be drained. A slight acquaintance with the science of geology will be sufficient to enable us to determine whether the site chosen will prove healthy or otherwise. The following is a list of the soils most commonly found with their general effect on health: Granite, Slate, Limestone, Chalk and Sands healthy. The latter vary however according to the amount of organic matter which they may contain and the fact that some sands are much impregnated with salts whereby the water becomes affected, must also be borne in mind, this will however be more fully entered into when we are treating on the subject of water itself. Clays and Alluvial Soils are generally unhealthy and should as far as possible be avoided. In the former water cannot penetrate and in the latter composed as they frequently are of repeated layers of sand and clay, organic matter penetrates the sand and being unable to get through the clay must necessarily rise into the air and thereby pollute it. It is a recognized fact that Malignant or Loodianah fever is always more or less prevalent in stations where the stables are built on alluvial soils.

Drainage.

The facility with which ground can be drained must also be considered. I do not allude to the drainage of the Stables themselves but to the drainage of the Moisture in the ground and the approximation to the surface of subsoil water and it may be laid down as a rule, that the deeper this is to be found, the more healthy will the Stables be. A case is reported by Pettenkofer in which horses of the same class occupying the same kind of stables, and fed on the same food, were affected with fever of a Malarious character, very unequally. The only difference which existed was, that in the healthy stables, the ground water was 5 to 6 feet and in the unhealthy ones only 2½ feet from the surface. Drainage of the latter and reducing the ground water to the same level as the former, rendered the unhealthy stables as healthy as the others.

Position of stables.

Another point to which I would draw attention in the selection of a site for building, is the position which the stables should occupy relative to the prevailing winds. They should be built diagonally or at right angles and not

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parallel to the direction of the wind, so as to allow the air to traverse their breadth and not to necessitate its traversing the whole length of the stable, driving organic emanations before it. By the adoption of this plan, a constant supply of good fresh air is thereby insured.

Having now noticed the main points to be considered in the selection of a site, I shall offer a few remarks on the construction of the Stables themselves.

Materials for building.

1st. With reference to the materials composing the walls, care must be exercised to obtain such as are the least absorbent, and at the same time expense must be considered. Burnt brick would seem to be the best material for the construction of them. Sun dried Bricks in India are very damp and absorb a great quantity of moisture from the air. It will therefore be seen that the employment of these is interdicted, for walls absorb organic matters, and retain them most obstinately. In a large Human Infirmary in the west of England that had been occupied for a length of time, so impregnated were the walls, that the Surgeons always feared the results of an operation, the whole of the building, having been placed under repair and the walls covered with non-absorbent material, has now been rendered perfectly healthy. Lime and Soorkey mortar appears to me the best to be used, the mud mortar which is sometimes used being so very absorbent, should entirely be discarded. Of course proper cement, were it not for the expense, would prove of great service but I fear its cost will prevent it ever becoming generally used. This leads me to the consideration of the best materials to be employed in making the floors, and feeling so strongly convinced as I do that the present mode of procedure is most prejudicial to the health of the horses, I must say that until Government sees the necessity of laying them down with some impermeable material, we shall be unable to claim exemption from the epizootics which from time to time make their appearance and commit such ravages amongst troop horses in this country. To this cause, mainly, do I attribute the various outbreaks of Malignant fever, and I believe that statistics will prove that in Stations where this disease has existed and the floors have been subsequently properly laid down, it has almost ceased to exist. If, as has been shewn above necessity exists for the walls to be composed of non-absorbent materials, how much greater must it be, that the floors, which are constantly liable to be impregnated with urine and other decomposing matters, should be composed of the hardest and most impermeable substances. The slight expense which would be thus incurred, would be as nothing when compared to the loss annually sustained, by the high rate of mortality from this disease. The most economical and at the same time effective mode of laying down a floor would seem to be a good substratum of broken brick with an upper surface of stiff clay both tightly rammed. The importance of this will be at once acknowledged I think, when it is pointed out that the present floors are in the majority of cases composed of Alluvial Soil which we have already seen

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is most permeable and consequently unhealthy, added to this, their absorbing power is increased by the soil being removed every six months not that I am of opinion that, whilst the present system is in force, they should remain in use for a longer period but it can be readily imagined how absorbent it must be for the first month before being thoroughly beaten down by the horses and thereby the seeds of disease are sown for the ensuing five months.

Ventilation.

I now arrive at one of the most important points to be considered in the construction of a Stable viz: the most effectual method of securing a free ingress of pure air and a free egress of polluted atmosphere and I may be permitted to digress a little for the purpose of pointing out the value of good ventilation, and its effects on the animal's health: I shall at the same time devote a little space to enumerate the gasses which are most commonly found in crowded Stables together with the most ready means of discovering their presence.

No one will, I think deny the value of free ventilation in the Stable. In India owing to the plan on which the majority of stables are built, so many points have to be considered; far different is it at home, where stables consists of buildings, which altho' they may possess the necessary means of allowing a free ingress and egress air, still are so much under the control of the groom, as to enable him for the purpose of making his horses appear sleek in their coats, to at least close all means of pure air entering his stable, altho' it be at the cost of his horses' health. I say, far different is it in India, but still there are points worthy of great consideration, for although the stables are as a rule well open and allow of a large amount of pure air to enter, still owing to the high temperature which materially assists the decomposition of both animal and vegetable matters, we must ensure the escape of these products together with the gasses and other matters the result of respiration of so many horses.

Pure air is of paramount importance to a horse's health and should that become impure from any cause, it at once becomes injurious, statistics go plainly to prove how much the health of horses has improved since attention has been paid to ventilation and by the following it will be seen that the death rate has also decreased in a most marked degree. Formerly in the French Army the Mortality was very great and Rorsignol in his "Traité d' Hygiène Militaire" states that in the French Cavalry previous to 1836 it varied from 180 to 197 per 1,000. Further that the enlargement of the stables and consequent supply of a greater quantity of air reduced the loss in the next ten years to 65 per 1,000. Statistics in the mounted portions of the English service, will also prove the beneficial results which ventilation has exercised on the health of the horses. No further evidence is needed to prove its value but I may mention the well known effect which impure air exercises in producing glanders, when horses are confined in the holds of ships, in which ventilation is frequently a matter of difficulty.

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Air, Composition of.

The atmosphere has in nearly every situation an uniform composition. It is composed mainly of two gases viz: Nitrogen and Oxygen in the ratio of 79 volumes of the former to 21 of the latter, together with these we find Carbonic Acid and watery vapour which, as will hereafter be shewn, increase under different conditions. We also find traces of other gasses such as Ammonia, and Sulphuretted Hydrogen these will have to be further alluded to when discussing the effects which vitiated air has on health. The process of respiration as carried on in the lungs, and the changes which take place in the blood in these organs go far to prove that Oxygen is necessary for the purpose of nutrition and for the purpose of combustion, whereby combining with the waste products of the body, it is returned in the expired air in the form of Carbonic Acid Gas. The Nitrogen would seem to act only mechanically in diluting the Oxygen, which in its pure state would be injurious to life. The effects of respiration on atmospheric air and the means by which they are effected will plainly prove the injurious consequences which must follow either overcrowding of stables or defective ventilation. The changes which are wrought in the composition of air during respiration are :—

1*st.* It is warmed. This first change aids us materially in carrying out a system of ventilation, as the various obnoxious gases which escape from the lungs are thus expanded and become lighter whereby they escape to the upper part of the building and are more easily removed.

2*nd.* The amount of Oxygen is lessened

3*rd.* Carbonic Acid is increased.

4*th.* The amount of watery vapour is increased.

5*th.* A small quantity of organic matter is added.

The organs which are instrumental in bringing about these changes are the lungs and subsequently the blood, we can therefore see that occupation of ill-ventilated stables will primarily effect the former organs and will tend, by introducing into the vital fluid, agents which are deleterious to health and in fact to the maintenance of the various structures of the body, to induce that state generally known as disease. The ill effects caused by badly ventilated rooms on the lungs are easily proved by reference to statistics and arguing by analogy we may affirm that ill ventilated stables exercise the same prejudicial effects on the horses. Parkes in his work on "Practical Hygiene" states that in a well ventilated House of correction in Vienna the mortality from Phthisis averaged but 7. 9 per 1000 whilst in the prison of Leopolostadt in the same city which was badly ventilated 51-4 deaths per 1000 occurred.

If impure air be supplied to the lungs it will be plainly seen that by altering the character of the blood every organ in the body must be more or less affected and this will be more readily understood when it is borne in mind that air rendered impure by respiration contains

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a certain quantity of organic matter consisting of epithelium, fatty matters and a peculiar fetid vapour which gives rise by its decomposition to products detrimental to health. In close ill ventilated stables the watery vapour so charged, when exhaled from the lungs, condenses on the walls, which if absorbent, will render the building in a short time an unfit habitation for horses. It is not however only by the deleterious products of respiration that the air of stables is contaminated but also by the exhalations from the skin and effluvia from discharged excretions, particularly are we interested in the latter in this country where the flooring of the stables is so frequently composed of alluvial soil in which the urine penetrates.

The most common impurities of the air to be found in stables are, as before mentioned, Carbonic Acid, Ammonia and Sulphuretted Hydrogen these being partly the products of respiration, which it must be remembered are great in the horse, owing to the size of the breathing apparatus; and partly gases and other matters evolved from the excreta; it must be palpable to everybody that the daily and hourly contamination of the atmosphere is very great, and to guard against this we have three special means in our power of successfully combatting these evils viz.

1 Preventing overcrowding.

2 Allowing sufficient cubic space to each horse.

3 Ventilation by which we can secure a free ingress of pure air and also a free egress of that which has become unfitted for respiration.

In addition to these means nature assists us greatly in many ways, such as by diffusion, dilution, exidation and transference by winds, all of which will hereafter be explained. With regard to the first means viz: Overcrowding, I consider that a spare stall should be allowed to every ten horses, this not only allows each horse a greater amount of cubic feet of pure air, but it has this advantage in addition, that we are thus enabled to allow a certain space to intervene between a vicious horse and his neighbour. This is frequently of great importance and will often prevent most serious casualties. The standings should be at least 8 feet wide, to this I attach great importance as I have found the percentage of accidents, very large in stables, where they are narrower.

The amount of Cubic Feet allotted to each horse varies in England from about 700 in stables of older construction, to 1526 which is allowed in the new military train stables at Aldershot. I believe that 1605 Cubic feet and 100 square feet of floor space is supposed to be allowed for each horse in England, but I can find no evidence of stables occupied by any corps reaching this large amount. A good stable in this country in which horses as a rule are healthy measures 8 feet + 12 + 12½ mean height, which would give exactly 1200 Cubic feet per horse. In a climate like India where, owing to the heat, decomposition of both vegetable and animal matters is so soon accomplished, we for-

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tunately are enabled to make use of the various modes which nature has so wonderfully placed at our disposal, of either diluting or of thoroughly destroying the gases thus generated, for although only 1200 actual cubic feet may be allotted to each horse, still the amount of pure air which a horse is enabled to obtain during the course of an hour, is owing to the construction of the stables, very great by its being constantly changed.

It will be necessary to explain in a few words the natural laws, before alluded to, by which injurious atmospheric agents are either destroyed or overcome. Procter in his work on the "Hygiene of air and water" says. "By the production of atmospheric winds or currents "impure air is constantly being replaced by pure, carrying away the "agents of mischief or diluting them to such a degree that they are "rendered innocuous, this therefore is what is understood by transference "by winds and dilution."

By diffusion is meant the property which gases and vapours have of spreading or diffusing themselves through each other. By virtue of this the heaviest gases rise in the air, and the most dense and most rare gradually mix with each other, the effect being the dispersing of vaporous matters and the dilution of the injurious air by that which is pure and wholesome. By oxidation is meant the power by which noxious ingredients of the air can be reduced to simpler and simpler forms until they are rendered inert, for oxygen alone or under the form of ozone is not only an essential constituent of the atmosphere but it is at the same time the great purifier.

Ventilation.

I now come to the consideration of the 3rd portion of this subject viz: ventilation, and by this term I wish only to include the artificial means which lie in our power to remove the impurities from the air caused by respiration, exhalations from the skin and effluvia from other excretions, for space will not allow me to consider many other subjects which usually form part of a thesis on Ventilation. Having already shewn how we are enabled to secure a constant supply of fresh air I have only to point out an error which exists in the construction of many stables in India whereby this much desired object is defeated. I allude to the custom of blocking up the ends of the stables by small rooms such as granaries &c. The ill effects of these rooms is not so great if the wind traverses the breath of the stables; but still at all times I think it will be admitted that stables open on every side are by far the most healthy. Having therefore considered the means which we possess of introducing fresh air it now remains to shew how the vitiated may be removed. The best plan yet adopted is that known as ridge ventilation. It has been shewn that the gases contained in expired air ascend owing to their expansion, and this therefore materially assists us. In constructing ridge ventilators, which should extend the whole length of the Stable, care should be taken to place them at such an angle, as not to admit of rain entering

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the stables. The Jhubulpore tiles lately used in the construction of stables seem to me the best mode of roof venilation. They consist of a single layer, their peculiar features being that the flat ones lock into the semi-cylindrical ones so that there can be no sliding neither are eaves required and thereby a free current of air is always in circulation at the upper part of a stable.

I have hitherto only considered the impurities arising within the stable but still have to note those caused by emanations from Vegetable decomposition. Quoting from the above named author he says. "Whenever beings, whether animal or vegetable, which have been alive are dead "and are undergoing decay, they evolve gases, vapours and other matters "which are not only offensive, but become prolific, predisposing or "exciting causes of a large class of Diseases termed Zymotic, or falling "short of this, affect the general health. The generators of these poisonous "vapours are found in stagnant pools, ditches etc." It therefore is important to see that the ground around the stables is so drained, so as not to allow water to lodge in their vicinity, especially in places where vegetation is abundant.

The effects caused by impure air are very numerous; in countries where pulmonary disease is more frequent than it is in India, we are well aware of the influence brought to bear on these maladies by close ill-ventilated stables but it is mainly with diseases due to an altered condition of the blood, by the introduction of some poisonous material, that we are interested. I allude mainly to diseases of an Anthracoid nature, and to Glanders Farcy. If the air is highly charged with decomposing matter, as it must be in ill-ventilated stables, the lungs and skin being unable to throw off these deleterious matters extra strain is imposed on the Kidneys. If the cause be removed, we may simply have to combat diseases of these organs but if on the contrary it is permitted to continue in force, death must speedily result and from organic maismata being given off from the bodies of animals so affected, diseases of a contagious nature are propagated.

Testing the Composition of air.

In examination of the air in Stables we are more commonly directed to enquire into the presence of the following gases viz: Carbonic Acid, Ammonia and Sulphuretted Hydrogen. For ordinary purposes we may lay down as a general rule that the sense of smell is sufficient to detect these impurities, for fortunately they have, especially the two latter, a fetid odour The former will cause a sense of oppression when present in large quantities, if this be the case, we then can at once affirm that such a place is an unfit habitation for a horse. Should however we be called upon to give a more precise opinion upon the air of a stable, the following simple tests will aid us in an investigation.

A basin of clear lime water will soon become opaque when exposed to the action of Carbonic Acid.

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Loquooa paper will be turned brown by Ammonia and Blotting paper moistened with a solution of subacetate of lead will be rendered either dark brown or black when brought into contact with Sulphuretted Hydrogen.

For the detection of organic matter I know of no simpler and at the same time effectual method than that of Condy's fluid. To ascertain the amount of organic matter in a stable, place four or more perfectly clean dishes of white ware in a line. Into each of these pour an ounce of distilled water. To the first add one drop of Condy's fluid diluted previously with two parts of water: to the second add two drops and so on according to the number of vessels. Let the dishes so prepared stand in a quiet part of the stable. On examining them at the end of the period, the state of the atmosphere can be judged of. If the solution in No. 1 has not entirely lost its pink color, the purity of the air is Normal: should No. 2 be decolorized the air must have been loaded with twice as great an amount of impurity, and so the loss of color in the others will demonstrate degrees of impurity verging more or less on positive pollution. This plan is not admissible for scientific purposes. but sufficiently accurate for ordinary sanitary purposes. By practice, this method is capable, in the hands of any person of common intelligence, of rendering important service in the management of stables and by its means, the occurrence of even a temporary undue accumulation of foul air can be rendered apparent.

Disinfecting.

I cannot close the present subject without making an allusion to the use of Mc'Dougall's Disinfecting powder which should be used freely in stables, during the summer months especially; in its use, care should be taken that it is not made a cloak for idleness, for I have occasionally found that when issued to a stable the same care was not taken in cleansing the floor as was done before. If cleanliness however is preserved it will be found a most useful aid in making stables which might be fetid and unsanitary pleasant and wholesome, for disinfectants and deodorizers properly and judiciously applied admit of extensive use, their advantages nevertheless should not be overrated, they are not substitutes for ventilation or cleanliness, in fact if no other preventive methods are adopted they are worse than useless by leading to a confidence which the experience of their use does not justify.

When commencing to treat on the subject of ventilation and its effects, it was not my intention to have entered so fully into the matter but so many points have to be considered (some of which I have been forced to omit, as not properly forming part of the subject matter of this paper) that I must be excused, when the importance of the supply of pure air is considered and I would conclude by enjoining on all persons in any way connected with horses in India, the prejudical effects produced by keeping horses inside the stable during the portions of the day or night when the outer standings could be occupied. In the

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summer months especially, benefit will be derived by only keeping them inside during the great heat of the day, allowing them to remain outside for as long a period as possible.

Drainage.

I now come to the consideration of drainage which in England is one to which too much importance cannot be attached but from the construction of stables and materials with which the floors are generally laid in this country, it may be said that no system of drainage exists. Sanitation is attended to in this Branch solely by the deodorizing effects of earth and removal of excreta. Drainage would be I fear a matter of great difficulty in the plains of India owing to the want of outlets, but having a fixed Basis viz: the recognized plan of an Indian Stable let us see what means we can employ to remove the excretions from the Kidneys and intestines with which we are now dealing. In the first place the slope of the floor is to be considered, a slight fall from the head of the horse will materially assist us, as it will allow the evacuations to approach closer to the entrance of the stable, where meeting with a large volume of air, the gases generated thereby, may be either partially or totally prevented from entering the stable and may also become diluted and thus be rendered inert. The daily removal of all earth contaminated with urine is one to which I would draw special attention, not sufficient is it to sprinkle dry soil on places which are found to be soiled in the morning but it is of absolute necessity, if we wish to keep our horses in health, that the whole of the soil to the depth which the urine has penetrated should be removed and replaced by fresh, in addition to this it is advisable to prevent as much urine falling on the floors as possible, as owing to their absorbent powers, the permeation of urine extends to a great depth. I have found the use of small chatties, for the purpose of catching the urine of the horses as much as possible, to answer well. Of course it is impossible to obtain and remove the whole but even if a little is daily saved from polluting the floors great benefit is derived. The fœces voided by horses should not be allowed to collect near the stable either in heaps or in baskets as they simply induce flies and are as has been shewn injurious in other ways. This leads me to the consideration of the disposal of the manure. I would suggest that as much as possible should be burnt between the lines as this is a very good remedy for flies which prove so troublesome during the summer months. The rest should be placed in the pit set aside for its reception and be daily removed. With reference to the position of this pit I would point out that it should be placed leeward of the stables and also at as great a distance from the water supply as possible for during the rains soakage into the ground is so great that should there be a well in the vicinity the water is likely to be polluted. In porous soils, such as alluvial, which so freely abounds in these districts, a well of 60 to 80 feet deep will drain an area of about 200 feet in diameter. Here then is a wide source of contamination and it will be at once apparent how advisable it is that no possible source of impurity should be placed in proximity to any well. It has been argued that the soil through which

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these substances pass will filter and purify the water; this argument holds good for a certain period but after a time the soil becomes surcharged with these impurities and its powers of purification are entirely lost. The ground of the manure pit should also be occasionally removed and replaced by fresh earth, as from manure constantly standing on it, effluvia by the aid of heat and moisture are likely to be disengaged and evil consequences will result. In stations where the grass lands are in proximity to Cantonments, the manure should be utilized, but as they are not, in many instances, sufficiently close, this is not practicable. Most stations however possess beds either of lucerne or guinea grass and to these the appliance of the manure will prove advantageous. It now becomes my duty to treat of those subjects which more particularly belong to stable management proper, such as the method of watering, and in this portion of the present paper, I purpose solely to treat of the way in which horses are watered at a trough in order to demonstrate the various accidents arising therefrom and shall leave the consideration of the quality and quantity to that period, when speaking of the causes of indigestion. We shall afterwards have to notice grooming, exercise, and shall then conclude with a few remarks on stable appliances in general.

Should it be considered necessary to water horses at a trough, although as I shall attempt to shew hereafter that it is desirable always to keep water before them in the stable, care must be taken that this is properly carried out, how often are we told when enquiring into the cause of an accident that it occurred either as the horse was being led to water or whilst he was at the watering trough. To guard against these accidents I would propose, that this duty be always superintended by Europeans, for such an important subject cannot receive too much attention, when I say European supervision should be employed I do not wish it to be understood that I allude to the stable orderly coming casually down and being present at the time of watering, for I consider that one man cannot possibly perform this duty, we cannot expect him to be omniscient nor omnipresent and as it is of importance that every horse should be seen out of the lines and at the same time watered, it can be easily inferred that more than one man must be present. Now with reference to the method of carrying out this duty I would urge that each horse should be led out singly, for greater care is then exercised and fewer accidents occur, in addition to which we know that one horse will drink more than another and if a Syce has charge of two horses he is liable to take them both away as soon as the first is satisfied. Horses should be led straight to the water trough commencing from the one which may happen to be closest to the watering trough; nothing can be more conducive to accidents than for horses standing on the lines to be taken out promiscuously especially if they are picketted outside. They have then to pass over the heelropes of other horses and casualties are sure to occur. Not only will this remark hold good when horses are being taken to water but on all occasions it is of the greatest consequence that the system which I have advocat-

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ed above, should prevail, if accidents are to be avoided. This system when carried out at watering also possesses the advantage of allowing the man superintending the removal of the horses, to see that every one has been led out. The duty of the man at the trough is of course to ensure every horse having his full supply. Overcrowding at the trough is also a fruitful source of accidents and one to be strenuously avoided. The above recommended system, if properly carried out, will avoid the necessity of forming up the horses prior to watering, which is also frequently the cause of kicks and other casualties.

Grooming.

In alluding to grooming it will be necessary to shew the reason why this operation is required and also to point out the ill effects caused by inattention to this portion of stable duties and I shall be more readily able to do this if I preface these remarks by a short description of the skin and its appendages with the functions of the various parts so as to be better able to shew that health cannot be maintained without cleanliness.

The skin consists primarily of two parts viz: the epidermis or outer and the cutis vera or inner layer. Within and beneath the latter we find several organs with which we are now mainly interested they are the sudoriparous and sebaceous glands and the hair follicles. The appendages are the hair and horn. The cutis vera forms nearly the entire thickness of the skin and adheres to the body through cellulo-adipose tissue. The upper surface or that covered by the epidermis is perforated by openings through which the secretions of the various glands are poured and also by others through which the hairs pass. On this surface are to be seen numerous papillœ, or small conical eminences in which the extremities of the nerves terminate the thickness of this portion of the skin varies as for example on the inner surface of the thigh it is very thin. The epidermis or outer layer is composed of several layers of epithelial cells those outwardly placed are flattened and scaly whilst those more deeply situated are softer and rounded, this latter layer is termed the Rete mucosum and it is in this portion that the pigments or coloring matter resides. The theory of the formation of the epidermis is that secreted as it is by the Cutis vera cells are formed which contain serum and that these constantly being constructed are naturally forced nearer and nearer to the surface, repeated layers are thus formed and that as they are removed further and further from the Cutis Vera, the fluid which they contain is absorbed and at last they are reduced to mere scales which are commonly known as scurf.

The sudoriparous glands lying in the Cutis Vera, or even in the subcutaneous areolar tissue consist of convoluted tubes which piercing both layers of the skin open on the surface of the epidermis.

The sebaceous glands also lie in the Cutis Vera and vary in formation from the most elementary, to compound lobulated glands and also

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terminate on the surface of the epidermis, there are some however which terminate by piercing the hair follicle. These structures which are met with in all parts of the body are more numerous in places exposed to extensive motion and friction.

The Hair follicle is a simple involution of the skin, at the bottom is a small projection of the true skin, which is the hair germ and from this the hair owes its growth, once destroyed, the part is denuded of its cappillary cover as is frequently seen in a case of broken knees.

With reference to the last appendages viz: Hair, and horn I shall offer no remarks, as were I to do so, it would be imperative to enter into the question of shoeing, a subject which would exceed the limits of the present paper.

Having now given an outline of the formation of the various structures entering into the composition of the Skin let us concisely pass in review their individual functions so as afterwards to be able to understand the diferent maladies which arise from the effects of bad grooming.

The Skin as a whole may be said to serve three important functions: viz:

1*st.* It protects the deeper structures.

2*nd.* It eminently possesses the sense of touch.

3*rd.* It is one of the most important excretory organs and through the medium of the hair which is a bad conductor of heat it may be said to regulate the heat of the body.

The first of these objects is gained by the hard horny scales of the epidermis and this as we know is frequently increased by a wonderful provision of nature when parts are exposed to much friction.

The second end is attained through the numerous sensitive papillœ, alluded to before, as covering the outer surface of the Cutis Vera, but especially in the horse are the longer hairs or tentacula, such as those on the lips and eylids, provided with the sense of touch whereby the animal is made aware of the approach of any offending object.

We must now pass on to the consideration of the third and most important function served by the skin viz: its power of secretion. As assisting nature in expelling from the system, materials which are not required for the purpose of nutrition or which may prove deleterious to health, we look upon the Skin as one of the principal organs and in conjunction with the lungs, kidneys and intestines, it greatly assists us in cases of disease to attain these ends. The organs engaged in the performance of this most important junction are the sebaceous and sudoriparous glands. The secretion of the former is mainly useful for

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keeping the skin moist and supple and as such they must be looked upon as secretory glands, but their function may also be looked upon as excretory also although from the difficulty to separate their secretion from the more watery products of the sweat or perspiratory glands, the exact share which they play in the purification of the blood has not been determined.

The sudoriparous glands are constantly at work, although we may not be aware of it, perspiration is constantly being excreted. In this fluid numerous salts have been found to exist but the most important materials eliminated from the blood are water and carbonic acid, both of which are exhaled in large quantities, as an eliminator of Carboric skin may be looked upon as a respiratory organ for it has been also proved to be an absorber of oxygen, in proof of which assertion, the experiments of Majendie point to the fact that when the skin of an animal is covered with an impervious varnish it soon dies as if asphyxiated.

Having now given a general outline of the anatomy of the Skin and its important functions it will be scarcely necessary to point out how essential grooming must be for the preservation of health, the fact must I think be apparent to every body, still the following question has been put to me on more than one occasion. If you consider it of such great importance that a high state of cleanliness should be maintained in a domesticated animal how can animals in a state of nature preserve there health? The answer to this, is, I think, very simple. In the first place the work of the former is faster than that of the latter and therefore combustion is more rapid and in the second place a greater quantity of nitrogenous food is given which supplies the materials for this object. The results of combustion having to be removed, the Skin is called into action and if unable to perform its functions disease must be the result

The main object therefore of grooming is to remove the secretions of the various glands together with dust and other objects which may have collected in the Skin, for if allowed to accumulate, the mouths of the tubes which have been shewn to open on the epidermis are, as it were, hermetically sealed and being unable to pour out their fliud, cause that state of the body which is commonly described as "the skin not acting," the result of which is invariably disease. If, as has been pointed out, the skin does not act, the gases which should be thus eliminated from the blood collect in the body and produce injurious effects. To guard against this, the use of the brush is plainly indicated and it is impossible to remove the various objects in any other way. The use of the wisp in a stable is simply subsidiary, altho' I fear in some stables on the contrary the brush is made subsidiary to the wisp, as a sleek coat seems the first object to be gained, if however health is desired, the former system should prevail. Care must also be taken in the choice of a brush, many sold in this country seem to be of good quality when first purchased but the hair is simply stiffened with gum, to guard against

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this, it is well to moisten them with hot water, when the gum will dissolve and the utter valuelessness of the article, as the means of cleaning a horse will at once become apparent. If at any period of the year a sparing use of a hard brush is indicated, it is at the seasons when the horse is shedding his coat.

Another result of bad grooming is the appearance of parasitic diseases. By accumulation of dirt these are sure to appear, and must, on most occasions, be looked upon as a disgrace to any one connected with horses. I say, on most occasions, for it may happen that they have been transfered from some other horse so affected. If however stable management is good, these cases are soon got rid of, if on the contrary it is bad, they spread rapidly.

Horses should be groomed as soon after exercise as possible. Nothing can be more conducive to disease than to allow horses to stand without being attended to. In grooming a horse, always commence at the hind legs as these are farthest removed from the centre of circulation and are the most liable to suffer from inattention. The method occasionally adopted of washing the legs or in fact any part of the body is open to the greatest censure. Independently of such diseases as grease and cracked heels, we know how serious are the consequences, even resulting in the death of an animal, that has been washed all over; the evaporation of a wet surface is very great and cold results, as we daily see in the simple operation of placing water in a draught or exposing it to the sun covered with wet straw. Washing in a stable is a proof of idleness on the Syce's part and bad supervision on the owners. I may add that "Bursauttee" is much more frequently seen in horses that are washed, than in those that are properly groomed.

The feet of a horse should be frequently picked out, nothing induces thrush quicker than inattention to this simple matter. The Eyes, Nostrils and Dock should be carefully sponged at every stable hour but let me caution persons against the use of a sponge next to dry. If cleansed with clean water, nothing can be more refreshing to a horse returning tired to his stable but if carelessly done, injury to the eyes will result. Great care at all times, but especially during the summer months, must be paid to the sheaths of horses, the troublesome ulcers generally known as Bursauttee arise very frequently from inattention to this, flies are attracted by the accumulation of secretion from the odoriferous glands surrounding the glans penis, and these sores occur as a result.

With reference to the removal of saddles I need scarcely mention that they should not be removed until the back is ready to be groomed. This however can be carried too far and to wait until the back is dried under the saddle causes the operation of grooming to be at times much delayed and thereby prevents the horse obtaining the rest which be otherwise would.

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This leads me to the consideration of the operation of singeing and clipping. The latter as being most practised in this country will alone be alluded to, I am strongly in favor of clipping horses and if space would allow could quote many instances where its non-performance has led to injurious results, as a rule all horses should be clipped taking care of course that their coats are properly set, if however there exists either a scarcity of machines or of men capable of using them, the horses that carry the longest coats should be selected. Experience teaches us that horses so treated are less liable to disease, thrive better even on less food and generally have a lighter and more healthy appearance. In England where their legs are exposed to the irritating effects of dirt and moisture, it is a good plan to keep the hair on the legs but no such precaution is necessary in this country. The cause of the good effects of clipping need not be wondered at when we consider that the hair is a bad conductor of heat and further when we think of the thickness of some horse's coats, the effects for example of sweating a horse in clothing is well known and the idea that a horse can thrive in this chronic state of sweating is to go beyond the laws of comprehension. In addition to this, great labor is saved to men attending horses as their coats when long are most difficult to dry. Whilst on the subject of hair and skin I would point out how advantageous is the principle of allowing horses tails to grow during the summer months when flies are so annoying, a little smart appearance is beneficially dispensed with in this direction.

The next subject to which we must direct our attention is that of exercise, without which no horse can be maintained in health. We shall have to consider. First, the effects of exercise on the various parts of the body and then proceed to enquire into the quantity which should be given and how it should be regulated with reference to the various seasons of the year. The question of Food and work and the relative proportion of the former to the latter is one which we shall be better able to discuss when speaking on Diet.

By the term exercise, merely the action of the voluntary muscles is generally understood, but although this is of great importance, I shall endeavour to show that other organs are thus functionally affected, such as the heart and thereby the whole system generally, including the lungs, skin and Kidneys also the digestive organs, to the maintenance of the functions of which we mainly look, knowing that when deranged, health materially suffers.

With reference to the heart, during exercise, especially of a fast nature, the action of this organ is greatly increased, whereby a greater amount of blood is sent to the various structures of an animal's body, after exercise the action of the heart is diminished in ratio to that in which it has been increased. The pulse, which is the indicator, if fast exercise be taken, will be quicker but regular, should however the heart be overstimulated the beats will become irregular and oppressed. We know the effects on ourselves, who has not suffered from palpitation

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of the heart after severe exertion, and in the human subject especially, diseases of this organ arise from an excess of this stimulant which is so beneficial when taken in moderation.

The effects on the lungs are, 1st that more oxygen is absorbed owing to a greater quantity of air being inhaled and as a consequence more Carbonic Acid and water are exhaled. The Carbonic Acid would appear from physiological researches to be mainly formed during the contraction of muscles, which will prove the necessity of muscular action, as without it Carbon cannot be properly eliminated and must consequently accumulate in the body to the detriment of health. On the other hand either excessive exercise or even moderately fast work given to a horse that has been previously pampered and not accustomed perhaps even to be gently exercised, will lead to disastrous effects to the lungs, this is frequently seen in the hunting field when either through the severity of a run or through an animal not being in con dition he sinks under the over-exertion through congestion of the vessels of these organs.

The effects on the skin are so well known that a few remarks only, will suffice. The heart by being stimulated sends a greater quantity of blood to this structure and its glands, and consequently perspiration is vastly increased. The evaporation thus caused tends to regulate the heat of the body. It will therefore be seen how necessary it is that a horse should be well groomed.

During exercise, except when horses are exercised very early in the cold weather, little or no clothing is required but I would urge the necessity which exists of at once clothing an animal on his return to the stable, should the weather be at all cold or should the operation of grooming be in any way delayed, as otherwise disease in some form is sure to make itself apparent.

The Kidneys are as a rule but slightly affected by exercise, except that the quantity of urine excreted is less owing to the loss of water which the body sustains by the elimination of water from the lungs and skin.

The digestive system is greatly benefitted by exercise, digestion is more perfectly performed and the absorption of the nutritive portions of the food is hastened, the liver, which in persons leading a sedentary life is inactive, is roused by work. As however food exercises such a marked influence on these organs, this portion of the subject will be deferred until Food and Work can be simultaneously considered.

I shall conclude the first portion of this subject by alluding to the changes produced by exercise on the muscles. They grow, become harder and better able to carry out their important functions. They however seem to have a certain standard, which once reached, cannot be exceeded, as we know that when over-exertion is taken for a lengthen-

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ed period they become wasted. This can be daily seen in a horse that is called upon to perform more than his fair share of work ; irrespective of whatever quantity of food may be given, he will waste and fall into that state generally known as want of condition.

We must now procede to notice the amount of exercise which is necessary to keep a horse in health and to best fit him for the work expected and shall have to consider this in connection with climate and the various seasons of the year.

Exercise to be beneficial should be regular, the mere fact of exercising a horse well one day must not be an excuse for leaving him in a stable the next. The results of this sort of treatment can be deduced from what has already been said of the effects of exercise on the various parts of the body. It would be a matter of difficullty to fix the amount necessary for a horse to take, for it is a well known fact some horses are able to undergo much more fatigue than others, still in the mounted branches of the service this is easily remedied, for the amount of exercise given is never beyond the power of any horse when in health, and it lies in the power of the Commanding Officer to equalize the amount performed by a horse to his capabilities, by placing him when in the field in the best position adapted to his strength. Young horses are those which require most careful treatment, their exercise should be regular and gradual, and in addition to this, the amount which each individual animal is able to perform should be watched and noted. No more fatal mistake can be made than to give every remount of a batch, that may arrive at one time, the same amount of exercise or work. Let it be from constitutional causes or from a difference in age there are sure to be some that will break down under this method of treatment.

The climate of India, varying as it does, especially in the Punjab, and North West Provinces, from excessive heat to intense cold, exercise has to be regulated according to its different ranges, for whilst in the winter horses are enabled to undergo a great amount of work, in the summer months, when the temperature is very high they are unable to withstand much exertion, without suffering ill effects. Horses cannot be kept in hard condition during this period, it must therefore be our object to keep them in health and gradually during the latter part of the hot season, when the weather is becoming cooler, to increase their work so as to ensure their being fit to undergo their more arduous duties during the drill season. Horses ought however to be exercised for 1½ hours daily, which should be accomplished at a walk with an occasional short trot, this together with short drills twice or three times a week, at which the pace should never exceed the trot will be sufficient to keep horses in health during the hot season.

Our object in giving exercise must be to increase the muscular power, to lessen the amount of fat and to increase thereby the respiratory powers ; a good instance of the latter can be daily seen when

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watching a race horse during training; by attention to the above few simple remarks it will be found that a higher state of health ensues and that the horse is able to undergo more exertion. I may mention a fact with reference to Bits and Bridoons in connection with those most troublesome phagadenic ulcers, which we so often meet with at the corners of the mouth and which incapacitate a horse for work sometimes for a lengthened period. From observations which I have made I find that they are frequently induced by two causes. 1st Exposure of Bits to the sun, before being put on. 2nd From exercising in Bridoons, the head collars at the same time not fitting properly. I would therefore prefer to see horses exercised in their Bits and needless to say mounted whenever practicable by Europeans. Having now dismissed the subject of exercise, it only now remains for me to make a few remarks on such articles as heelropes and mode of fastening horses. Blankets, Bedding &c., and then to pass on to the second portion of this paper in which other things connected with stable management will have to be noted, as however they more particularly enter into the causes of Indigestion, they will not be spoken of now.

In alluding to the mode of fastening horses I would draw especial attention to the shackles and heelropes, as being the most frequent cause of accidents. In the first place I consider that the new pattern single shackle is open to numerous objections. The leather, of which it is composed, is too thick and becomes hard when exposed to either wet or heat and in addition to this, it is cut square instead of being rounded, the result being that frequent abraisions and lacerations of the Heel occur, the fastening (hook and eye shape) is also open to the objection, that should a horse be cast, it is often impossible to loose him. I have found that the percentage of causualties was greater in those stables that use the single shackle than in those in which the double one is preferred. Care has also to be exercised in securing a horse so as to enable him to lie down comfortably and at the same time not to injure his neighbours, and the benefit of wide stalls will now be evident as it enables us to give a horse more liberty without increasing the number of accidents in the stable. In all shackles, irrespective of whatever pattern may be adopted, we find it necessary either to soak them occasionally in oil or to frequently apply soft soap, for the purpose of keeping them supple.

We next arrive at the consideration of how the head ropes should be fastened to the ground, the method usually adopted is that of inserting pegs in the ground to which the ropes are attached, here we have a fruitful source of accidents, sometimes even of a most serious nature. I have seen cases of Vential Hernia arise therefrom, that have incapacitated horses from work for a considerable period, and it has often been a matter of surprise to me that in permanent stables, Government has not long since seen the advisability of inserting stones in the ground to which iron rings can be fixed and to which the ropes can be attached. The first outlay would certainly be greater than the purchase of pegs,

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but once obtained they would seldom have to be replaced and the saving in accidents by these rude articles would be great. In a permanent camp, the plan of bushing is one worthy of notice. Some horses are constantly in the habit of getting loose by slipping their head collar. This can be remedied by shackling their four feet to the ground and dispensing with the headstall, it has the objection however of interfering with the free motion of a horse in lying down but this is fully compensated by preventing him from being at large and perhaps inflicting serious injuries on a great number of his stable companions.

I would now offer a few remarks on Blankets their use &c. The use of these articles is twofold.

1*st* and principally as a protection against cold and 2*nd* as a protection against heat, this latter is however only employed when horses are exposed to the direct rays of the sun, at these times, as is well known, a Blanket thickly folded over the loins preserves the kidneys from disease. As serving their first and most important object it is of course necessary that they should be of good quality, the best tests being their weight which should in an ordinary sized one not be less than 8lbs. The closeness of texture and softness of material should also be taken into consideration. Blankets should be cut out and shaped in in front, this greatly assists us in keeping them properly placed, attention to this prevents their wrinkling under the pad and causing sore backs. As made of wool, these articles are great absorbers of moisture, which as has already been shewn is constantly arising from the body, it will therefore be seen that unless exposed occasionally to the effects of the wind and sun, they will become very foul. In private stables the use of a thin cotton cloth during the summer months is very great, as a remedy to the irritation caused by flies. Allusion was above made to pads, these referring to stable management must be cursorily considered the effect when once they become hard is to cause contusions of the back, which at times are most troublesome, and as much attention should be paid to the stuffing of these articles as is now giving to the replenishing of saddles with hair.

The use of Bedding with horses is clearly indicated; very frequently however from the great difficulty to procure it, horses are compelled to lie on the bare ground, the effects of this are to cause abraisions of the hocks and other parts. During the winter months however, the effects are more serious; by providing a horse with a good bed great warmth is obtained and as litter is more easily procured during this period, horses should then be supplied with it. Litter should, after the soiled portions, are removed be freely exposed to the air every morning; not as is however frequently done by throwing it in a lump outside the stable but by exposing a large surface to the disinfecting and deodorizing powers of the atmosphere. Care should be taken to prevent horses eating their bedding, greedy feeders will always do it if possible, to the detriment of their health, the surest remedy is to place that which has

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been in use for sometime close to the head and the newer portion towards the hind extremities.

Having now enumerated the various subjects which go to form either a good or bad system of stable management. I trust I have succeeded in shewing of what paramount importance, these matters should be to every horse owner. Of course it is impossible to make a general summary, as this naturally is, sufficiently elastic to meet every case, an amount of responsibility must rest with those in charge of large bodies of horses, but I think that with a reasonable amount of care and thought, combined with attention to the foregoing principles, success will not be a matter of much difficulty. In conclusion let me impress upon my readers the necessity of supervision. What an amount of misery could be saved and what a much greater amount of work could be obtained from our poor dumb patients, were supervision properly carried out. In no country is this perhaps so necessary as in India and certainly it is one that demands the serious attention of all Commanding Officers. If a body of horses is in bad condition and the causes are enquired into, it will not be difficult, in the majority of cases, to trace them to a general want of supervision. I have already shewn when speaking of the best method of watering horses that unless superintended by Europeans neglect will follow, either the horse will not be removed from the lines or if he is, he will be drawn from the trough before he has taken a sufficient quantity. If therefore supervision in watering is necessary, how much more should it be in feeding ; especially in this country where the staple food of the Native Establisment consists, as does that of the horses, in farinaceous substances, the greatest care is necessary to prevent robberies of grain and should even a very small quantity be removed from a horse's feed on each occasion, it will be readily understood how soon he will shew signs of it. It is therefore imperative that the strictest supervision be exercised when feeding, not as is sometimes done by instructing the line orderly to be present at all feeding hours, for although he may be ever so vigilant it is a matter of impossibility that he should be able to superintend the feeding which takes palce simultaneously in 2 or 3 stables, one man should be detailed for every line of stabling to ensure success. The granary especially, should be under the entire control of an European, who should not permit the key to leave him even for a short space of time. It has been found of great advantage, in some instances, that a building in the vicinity of the lines should be allotted to the line orderly, if this is done and he be an energetic man. he is able to constantly see what is going on in the lines and may be the means of preventing a great number of abuses.

(To be Continued.)

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IV.

THE RUSSIAN CAMPAIGN OF 1879 AGAINST THE AKHAL TEKKE TURKOMANS.

CONTAINING THREE VERSIONS OF THE ENGAGEMENT KNOWN AS THE ACTION OF GEOK- OR DENGIL -TEPE, AND A DESCRIPTION OF ITS DEFENCES.

Compiled and translated from the Russian of the Official Press and other Newspapers.

BY P. MOSA.

FROM CHIKISHLAR to Duz Oloum the Russian troops marched echelon-wise in small detachments, the infantry usually breaking ground between two and three o'clock A.M. to avoid moving in the heat of the sun. The cavalry, however, did not start before six in the morning, in deference to the horses, their best hours of sleep being those preceding the dawn of day.

On the 24th of August* General Lazaref reached Chat, where he arrived in so weak a state that he had to be lifted from his carriage. Nevertheless he immediately dispatched a Cossack orderly to Duz Oloum, about 30 miles beyond Chat, with a letter announcing his arrival there on the day following. Throughout the 25th Colonel Malama, the chief of the staff in command at Duz Oloum, was accordingly expecting the Commander-in-chief; but General Lazaref was not destined to recover from his illness: he expired at half past four in the morning of the 26th August. In consequence of his demise the command over the expedition was taken up by Major-General Lamakin, Governor of the Trans-Caspian region, upon whom it devolved in his capacity of senior officer.

The 18th of August witnessed the first exchange of shots with the enemy. On that day the Russian vanguard, led by Colonel Prince Dolgorúki, was fired upon by a body of Tekke Turkomans while advancing from Ters Akan to Hojam Kala. To punish them, Prince Dolgorúki detached a company of infantry and two sotnias ('hundreds') of cavalry to sweep their camping grounds and settlements, which was successfully done on the 23rd August. The flying detachment lost a

* (All dates are given in the new style.)—P. M.

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trooper, who was missing, and had two men wounded: but returned with rich booty, having captured 6000 sheep and 1200 camels.

On the 3rd and 4th of September the first column crossed the Kopet Dag without a mishap. Bashi and Beurma were found deserted by the inhabitants, but at Archman the inmates of about fifty kibitkas* had not fled with the rest. In the evening of the 6th the vanguard of the first column bivouacked at Ghurun (? Dúrún) and the main body, at Archman. On the same day the enemy were reported to be gathering in great force about Geok Tepe, avowedly with the intention of opposing the advance of the Russian columns. In the small forts passed *en route* the Russians had come upon large stores. The troops enjoyed good health.

As above mentioned, the aùl (village) of Archman was not wholly deserted when the Russians reached it. Indeed, on the strength of a message previously received from its inhabitants, Prince Dolgorúki expected to find them at home to a man. But in reality their declaration of submission proved a ruse: intended to prevent the Russians from treating the village as a hostile place, and to avoid the necessity of removing their wives and children, and the infirm: for not a single man capable of wielding arms had remained on the spot. Archman is protected by two small square-shaped earth-works—named *kalas, i.e.* 'fortlets'—one of which contained several kibitkas and a large quantity of dry *yunja* (? probably some kind of hay). The aùl is intersected by a network of irrigation ditches containing clear and cold fresh water, and the surrounding lands are well cultivated. Among the crops the Russians observed, for the first time to the eastward of Chikishlar, cotton and *kunjut* in addition to *juara* or *jughara*, which is common throughout the length and breadth of the Trans-Caspian steppes. From the seed of *kunjut* the Turkomans press the well-known oil of the same name. Having had nothing but mutton for some time past, the officers had hoped to obtain some other victuals for a change of fare at Archman; but not many of them succeeded in realizing this expectation, for the people had hidden nearly all their surplus eatables. For the few fowls and eggs, etc., that were at last forthcoming, they uniformly demanded one *abaz* (Russian coin of twenty kopeks): asking neither more nor less whether the lots parted with consisted of one or two fowls, ten or twenty eggs, or of a jug of milk, and so forth. In short, having once discovered that the Russians were in possession of *abaz* pieces, the coin of itself became a standard-unit of value for every thing they had to sell with the Turkomans. Towards the evening a party of highlanders came down from Nuhur, a somewhat inaccessible aùl in the hills, arriving with large baskets full of yellow grapes of excellent taste and quality, which sold as fast as they could distribute them to the Russian troops. The inhabitants of Nuhur have not sided with the Akhal

* (*Kibitka* is the name of the Kirgiz felt-tent, also used by the nomad Turkoman tribes. In Russia the term denotes a spacious covered traveling sledge.)—P. M.

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Tekkes, and remained perfectly neutral throughout the time of the campaign.

From Hojam Kala, the first Tekke fortlet on the way from the Caspian to the Akhal Tekke oasis, the Russians advanced to Band-i-San (Bendessen). Hojam Kala occupies a fine spot 2,100 feet above the sea-level, has an abundant supply of good spring water, and is a healthy place in consequence. To Band-i-San, and farther, the Russian vanguard was accompanied by Tekmes (also written Tekma), a Tekke Turkoman Sirdar. Having witnessed the landing of all the Russian forces at the invitation of the late General Lazaref, Tekmes had comprehended the futility of such resistance to the Czar's invading army as the Turkomans were capable of, and had therefore endeavoured to dissuade his countrymen from hostilities against the Russian columns. But the Akhal Tekkes, dissenting from his view, rejected the idea of peaceable submission; and on the friendly Sirdar's return with the news that the Akhal tribes were preparing themselves to fight for their independence, the Russians commenced their arduous eastward march. Tekmes, his son, and a few of his followers were permitted to accompany the expedition, his knowledge of the steppes being frequently consulted by the Russian officers, though some of the latter suspected him to be in secret communication with the enemy.

The route from Hojam Kala to Band-i-San runs parallel to a range of hills. Here the soil is a mixture of clay and some sand, producing a little *koliuchka*—a prickly herb, the so called 'camel-grass'—now and again over-topped by a solitary saxaul shrub. Half-way between the above-named two points there is a spring pouring out excellent water. Beyond Band-i-San, where the troops halted in the vicinity of several good springs, the Russians entered the Akhal Tekke oasis proper, a region never before traversed by any European.

(Further I translate *in extenso* the following three narratives of the ill-fated Russian attack on Geok- or Dengil -Tepe, as they appeared in different Papers. Full details regarding the equipment and organization of the expedition with its baggage train and transport arrangements have not yet been published, and may never be permitted to find a place in the columns of the Press.—P. M.)

I.—Telegram from General Lamakin, dated 'Beurma the 16th September 1879:'*

"Between the 3rd and 10th of September the first column effected a reconnaissance in force towards Geok Tepe, near which place, on the 9th, a strong body of Tekkes repeatedly attacked our foremost troops; but our men held place, bravely repulsing each charge, their well-aimed bullets decimating the ranks of the enemy. At Dengil

* Beurma lies about 200 miles to the north-east of Chikishlar.

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Tepe, in the vicinity of Geok Tepe, the Turkomans were found to have thrown up strong earth-works, garrisoned by about 15,000 men. Despite their staunch defence our troops took the most advanced trenches, inflicting heavy losses on the enemy, whereupon the place was shelled for six hours by the entire artillery (twelve guns). This bombardment had a terrible effect, for the aûl was crowded by upwards of 20,000 men, women and children; the prisoners estimate the loss sustained by the Akhal Tekkes at several thousand souls. At five P. M. our troops renewed the attack, effecting an entrance into the outworks. But, unable to penerate farther, owing to insuperable difficulties at every step, they were compelled to halt towards night-fall, whereupon the enemy escaped under cover of the darkness. Pursuit proved impossible: for the men, having fought the whole day, were too fatigued to give chase. The behaviour of our troops under fire was excellent. Our casualties number seven officers and 234 men killed and wounded.* This reconnaissance has rendered our further line of action quite clear. To-day the main column has occupied Fort Beurma, where I am going to establish a depot of provision and artillery stores. This defeat of the Tekkes, combined with the heavy loss they have suffered, may be expected to facilitate our task."

In continuation of this telegram the *Kafkas* published the following list of the names of Russian officers killed and wounded in course of the attack on Dengil Tepe:—

(a) Killed: Sub-LieutenantGrigōryef and Ensign Tyshkévich of the Erivanski regiment; Ensign Beloborōdof of the Gruzinski regiment; Major Safōnof of the second Caucasian battalion of rifles; Captain Skorino and Ensign Smirnōf of the Kabardinski regiment.

(b) Died of their wounds: Lieut. Dével of the Balinski, and Staff-Captain Yākovlef of the Shirvanski regiment.

(c) Wounded: Staff-Captain Chekoidze and Sub-Lieuts. Kiknadze and Ardi-Shvili of the Erivanski regiment; Staff-Captain Romishefski and Sub-Lieut. Yermolāyef of the Gruzinski regiment; Ensign Schmidt of the first, and Captain Papof, Sub-Lieut. Neftōnof and Ensign Semionof of the third Caucasian fusilier battalion; Lieut. Sush-chinski of the Kurinski regiment; Lieut. Golovachof and Sub-Lieut. Gúzākof of the Kabardinski regiment; Major Schaufuss, Staff-Captain Semionof and Ensign Mardanof of the Shirvanski regiment; Lieut. Lipinski of the second Caucasian battalion of sappers; and Lieut. Ghaitof of the Kutaiski irregular horse.

In all: six killed, died of their wounds two, and seventeen wounded.

II.—Narrative written by a Russian Press correspondent.

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* (According to a telegram published in the *Golos* the Russians lost seven officers and 178 men killed, and had 16 officers and 234 men wounded.)—P. M.

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"An old proverb says: 'man proposes, God disposes!'—the truth of which has again been illustrated by our unsuccessful attack on Geok Tepe. All along our main apprehension was that the Tekkes might not stand, and hence afford us no opportunity of giving them a sound thrashing; but fate willed it otherwise.

"On the 9th of September our first column, effecting a reconnaissance in force towards Dengil Tepe, was advancing in three detachments. The foremost of these, forming the vanguard and marching from five to six miles ahead of the centre, was composed of three battalions of infantry, two squadrons of dragoons, two sotnias of the Daghestan regiment of irregular cavalry, two sotnias of Cossacks, one battery of horse-artillery, and one rocket sotnia: under the command of Colonel Prince Dolgorúki; the centre, led by Major General Count Borch, comprised three battalions of infantry, two sotinas of Cossacks, and a field battery of foot artillery; the rear was made up of the train (*Wagenburg*) protected by a convoy of six amalgamated companies under Captain Kehāmof. Within six miles of Dengil Tepe the vanguard was suddenly surrounded by a strong mounted force of Tekkes who attacked our left wing, but were repulsed without casualties on our side. Having lost three killed, the enemy fell back upon a mill that had been fortified by earth-works and formed a strong position. Following them, Colonel Dolgorúki detached the two Daghestan sotnias, the dragoons and the rocket sotnia to take the mill, which they speedily accomplished under the command of Lieutenant Colonel Prince Chafchavadze, losing two men but killing fifteen of the enemy. After some firing on both sides, we charged at the point of the bayonet, decimating and overthrowing the Turkomans, who fled to Dengil Tepe, leaving a large number of killed on the ground. Our casualties were not of a serious nature.

"At five P. M., by which time Count Borch's detachment had come up, the united column stormed the Tekke strong hold; but despite the desperate bravery of our troops the attacks had to be given up towards night-fall, and we were compelled to fall back upon the above mentioned mill, from which we had again to retreat for nearly a mile somewhat later. Throughout the whole night the Turkomans did not cease harassing our fatigued men, and early on the 10th, when all had at last been overcome by sound sleep from sheer exhaustion, the enemy again assaulted us in overwhelming numbers—whereupon our bivouac became one indescribable scene of confusion.

"Our total loss amounts to 21 officers and 412 men, the number of killed, to 183: seven officers and 176 men. Considering that each of the storming battalions counted but 250 to 300 combatants—the rest having been detached on convoy duty with the train—these heavy casualties make up on unheard of percentage.

"On the 15th of September the column returned to Beurma. Night after night the Tekkes continued worrying the retreating Russian

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troops, frequently cutting off the water supply at the halting points, till at last, on the 28th, they succeeded in reaching the safe position of Ters Akan, there to await the arrival of General Tergukassof, the new Commander-in-Chief. The sick and wounded were sent on to Chat, where temporary hospital accommodation had been prepared for them."

III.—Official account of the Russian attack on Dengil Tepe (Geok Tepe) as published in the *Kafkas*.

"About the 15th of August the late General Lazaref formed a special field column with a view of invading the Akhal Tekke oasis, the rest of the expeditionary forces covering our lines of communication in the Attrek valley, between Chikishlar and Duz Oloum.* This field column was composed of eight and a quarter battalions of infantry, two squadrons and seven sotnias of cavalry, and 16 pieces of artillery. General Lazaref died on the 26th of August, on which day the vanguard had reached Band-i-San, crossing the Kopet Dag, while the remaining echelons of the column were bivouacking at Hojam Kala and Duz Oloum. Major-General Lamakin, Lazaref's successor by seniority, left one battalion of the Apsheronski regiment in occupation of Hojam Kala, and concentrated the whole column at Band-i-San; from whence, on the 3rd and 4th of September, he marched his forces *via* Bami to Beurma, having garrisoned Band-i-San by a battalion of the Shirvanski regiment and a troop of militia horse with two guns to protect the train of waggons with a portion of the provisions, as it was found impossible to move the same over the difficult pass leading into the Akhal Tekke oasis.

"The column left Band-i-San in two detachments, followed by a train of camels carrying victuals for fifteen days; all other necessaries had been reduced to the smallest safe quantity. The first detachment, forming the van under the command of Colonel Prince Dolgorúki, comprised:—one battalion of the Kurinski and one of the Kabardinski regiment; the Caucasian battalion of fusiliers; a division of Pereyaslafski dragoons; one sotnia of Volga and two sotnias of Daghestan irregular horse, and eight guns—four pieces of horse- and four of mountain artillery. Having under considerable difficulties crossed the hills, this force reached Beurma in the evening of the 4th September, and continued advancing on the following day *via* Archman, Sunghi, Murga and Baharzak, halting at the village of Dúrún to await the second detachment. This latter, under the command of Major-General Count Borch, was composed of three battalions of the Erivanski, Gruzinski and Shirvanski regiments, respectively; two sotnias of Tamanski and one sotnia of Volga horse, and four field guns. Count Borch left Band-i-San on the 4th and reached Dúrún on the 7th, advancing by the same route that the vanguard had taken. Throughout this march of nearly 60 miles

* Situated at the confluence of the Chandyr with the Sumbar.

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the enemy did not show themselves, and the above named aûls passed on the way—Archman excepted—were found deserted. Some of the inhabitants of Archman, as also their neighbours, the highlanders of of Nuhur, sold poultry, eggs, fruits, vegetables, etc., to our troops. The country between Band-i-San and Dúrún contains much water and is comparatively well peopled and cultivated, and everything in the villages and fields went to show that the inhabitants had but quite recently abandoned their homesteads. They had, indeed, scarcely gone when the vanguard appeared, having removed their families and as much of their cattle, provisions, and so forth, as they could carry away to Geok Tepe and Askhabad.

"In the vicinity of Dúrún our cavalry scouts came upon a small body of Tekke horsemen, who fired a few shots before they disappeared. On the 8th the column resumed its advance, passing the deserted villages of Karagan, Akh Tepe, Yangi Kala and Mehin on the route to Yaroja, which settlement was gained by three o'clock in the afternoon of the same day, after an unmolested march of fifteen miles. At Yaroja General Lamakin seperated the trains of both detachments from the column proper, distributing biscuits for two days to the men, and providing the vanguard and the second detachment with the necessary number of camels to lift the ammunition boxes and water-casks; of all the remaining baggage and the *Wagenburg* he formed one train in the rear, covered by a convoy of six companies of infantry, a sotnia of Taman horse, and two mountain guns. At dawn of the 9th the column advanced in battle-array, the vanguard marching about three miles ahead of the second detachment, and the train following close behind the latter. Within eight miles of the fortified aûl of Dengil Tepe numerous bodies of Tekke horseman appeared on both sides of our vanguard, those towards the right occupying the aûl of Egman Batyr, while the bands on the left side had taken up a covered position behind some hillocks. Having apprised Count Borch of their presence, Prince Dolgorúki continued his march. Towards 10 A. M. a mounted force of nearly 1000 Tekkes swept down from Egman Batyr, charging the right wing of the second detachment and attempting to surround the train; but our guns and rifles proved too much for them, and they were immediately driven back by the Volga horse, supported by a troop of Trans-Caucasian militiamen and three companies of the Erivanski regiment. The defeated Tekkes returned to Egman Batyr, from whence they did not stir again throughout the day. Our casualties amounted to seven in all. Simultaneously another hostile detachment attacked our foremost line of mounted skirmishers reconnoitring ahead of the vanguard; but our cavalry under Major General Prince Wittgenstein repelled the charge, and the enemy retreated—partly to the north of Dengil Tepe, and partly beyond it, halting about a mile and a half in the rear of its fortifications.

"The aûl of Dengil Tepe forms a square. To the north and west it is protected by a deep outer moat within steep scarps, measuring fourteen feet in width, whereof the inner scarp culminates in a breast-

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work, behind which there is a second moat, partly floaded from the irrigation canals. Then follow several rows of kibitkas, some wholly filled with earth so as to form solid kibitka-ramparts, as it were; others placed over purposely excavated deep hollows, thus masking the obstacles which these present to a storming enemy. Inside the kibitka lines runs a third moat, crowned by a second breastwork, within which all the Tekke Turkomans that had left their homes to the westward were encamped together with their wives and children, their cattle, and so forth. The interior of the aùl as well as its vicinity is intersected by a large number of irrigation ditches, and by an intricate network of low mud-walls, not exceeding two feet in height, which separate all the gardens and cultivated plots of the inhabitants. About 700 yards in front of the outer moat flows the current of the main irrigation canal, the force of which is utilized to drive two mills; at this point the Tekkes had erected a small shut-in outwork, facing the main corner of the defences of Dengil Tepe proper. According to the statements of several prisoners and the information furnished by the friendly Sirdar Tekma—Chief of the forts situated in the north of the Akhal Tekke oasis, who accompanied the expedition—Dengil Tepe was defended by about 15,000 men, horse and foot, mostly armed with swords and lances: of firearms they had but some common muskets, a small number of rifles (the latter useless at long ranges), and a few wall-muskets distributed along the ramparts.

"Within 1400 yards of this stronghold the vanguard was halted for an hour to afford the men some rest before the hard struggle that was about to take place, after which Prince Dolgorúki formed his infantry into battle array, and attacked the most advanced hostile position in front of the mills on the main irrigation canal; at the same time the cavalry of the first detachment under Lieutenant-Colonel Prince Chafchavadze were ordered to dislodge the Tekke horsemen on the north side of the aùl, in order to turn the enemy's flank and to take the rear of the place. This was gallantly done by our troopers, who had no sooner commenced to cross the canal above mentioned than the enemy opened a smart fire from the mills and the earth-works surrounding them; but the Daghestanese put the hostile skirmishers to flight, and carried the mills by a daring assault; whilst the fire of our rocket battery, supported by the dragoons, at the same time intercepted a strong body of Tekke infantry issuing from the aùl, repulsing the enemy before they could succour the dislodged garrison of the mills, and clearing the whole ground in front of the northern rampart of the Turkoman forces. Meanwhile two sotnias of the Daghestan regiment, led by Lieutenant-Colonel Prince Galítsin, had attacked a strong outwork on the east side of Dengil Tepe. Dismounting, in front of the intrenchment, our horsemen took it by storm, and thereon charged a force of Tekke infantry advancing from the aùl to retake the position, completely scattering the enemy who retreated beyond the main rampart. Reinforced by a squadron of dragoons, Prince Galítsin held the ground gained on the east side, repelling the Tekkes whenever they attempted to molest his line of attack. Simultanously with these

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preliminary charges on the part of the cavalry, all the batteries of the vanguard maintained a sharp fire upon the densely crowded trenches and enclosures in front of the outer moat. Before long this bombardment had the effect of driving the enemy from their outworks, and our infantry crossed the main irrigation canal to storm the first breastwork of Dengil Tepe. This movement, however, had barely commenced when the Tekkes, suddenly deploying out in great force from behind the ramparts and mudwall hedges as well as from the moat, gave a fierce yell and rushed upon our storming parties; but the latter overwhelmed them with a hail of bullets and grape-shot, before which they had to recede, leaving a large number of killed behind them. From their outworks and trenches between the main canal and the outer moat the enemy were thereon driven out at the point of the bayonet, our horse-artillery inflicting severe punishment on them, firing from a distance of about 470 yards. The Tekkes having thus been dislodged from all their outer defences, Prince Dolgorúki decided to postpone the assault on the main works till the arrival of the second detachment—a delay dictated by the great numerical superiority of the Turkomans, as also by the determined energy of their resistance. Occupying every sheltered spot between the main canal and the outer moat, our infantry crawled up close to the latter, while the artillery continued shelling the aùl and its lines of defence.

"Count Borch's detachment arrived towards three o'clock P. M., and after a short breathing-while his men were formed into battle-array, to lead the attack upon the northern ramparts. In the meantime his artillery had already joined the batteries of the vanguard in the bombardment of Dengil Tepe, which was thus completely encompassed on the north and west, and, partly, on the east side. The storming column proper was composed of: one Kurinski and one Kabardinski battalion, three companies of the fusilier battalion, one company of sappers, and two field and two mountain guns—forming the right wing; and of Count Borch's detachment, a part of the remaining cavalry, one battalion of the Erivanski and one of the Gruzinski regiment, a company of the fusilier battalion, a squadron of dragoons, and six guns—four of horse—and two of mountain artillery—constituting the centre and left wing. Our extreme left flank, opposite the eastern defences of the aùl and the route to Askhabad, was held by two sotnias of the Daghestan irregular horse and a squadron of dragoons—reinforced before long by half a squadron of the Pereyaslafski and a sotnia of the Taman regiment with two guns of the horse-artillery. The reserve was made up of two battalions of the Skirvanski regiment, and of two sotnias of Volga and Taman horse, and was placed near the train (*Wagenburg*) that had been halted about a third of a mile to the westward of the main irrigation canal together with its convoy of six companies, composed of men of all the above-named battalions. The still prolonged fire of our united artillery, mustering twelve guns and aimed at the comparatively small and densely crowded village and its defences, had a terrible effect upon the garrison: killing Kara Batyr; Berdy Murad, Nurverdy

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Khan's eldest son directing the defence of Dengil Tepe; and upwards of a thousand mounted Tekkes and foot-soldiers: greatly disheartening the rest. Towards five P.M. it was ascertained that the bombardment had compelled all the Tekke horsemen, loath to face our troops again after the defeats sustained by them in the morning, to evacuate the aûl; they had gone to Askhabad, where the Akhal Tekkes and those of Merve are known to have jointly pitched a second fortified camp with the intention of opposing our invasion. Moreover there began to appear small parties coming from the rear of the hostile position, praying for a suspension of the bombardment and uttering the wish to open negociations. Our reply to each of them was: "Let your Chiefs and Elders come out, and we will treat with them." The Chiefs and Elders, however, preferred to stay inside, and the firing from the ramparts went on faster than before, although it was rumoured that the Tekkes intended quitting Dengil Tepe to a man after night-fall, to retreat on Askhabad. On the face of these symptoms telling their own tale of the growing demoralization within the hostile camp, and taking into account the impossibility of remaining inactive for any length of time: owing to the scarcity of victuals, combined with the uncertainty of replenishing the nearly exhausted stores: it was decided to attack Dengil Tepe without further delay.

"The order 'to storm' having been sounded at five o'clock in the afternoon of the 9th September (August 28th old style), the entire column assailed the outer moat and breastwork of the Tekke stronghold. Defying the bullet-rain that poured down upon them from the ramparts, our men gallantly rushed across the exposed ground intervening between them and the hostile lines of defence, and the infantry of the centre and left wing—the latter commanded by Count Borch—succeeded in taking the northern outworks, pursuing the retreating enemy towards the main rampart; but in front of the latter our advance was checked by the defenders, occupying an exceedingly strong position behind their inner water-trench, and fighting under cover of their kibitka lines. In the meantime the right wing under Prince Dolgorúki had failed to carry the first breastwork, whereupon, after a most desperate yet bootless hand to hand struggle extending over the whole line of assault, it became obvious that the attack could not safely be prolonged against the numerically vastly superior garrison, and the order of retreat was passed accordingly.

But no sooner had the troops commenced to fall back than a body of about 3000 Tekkes, descendiug from the northern scarp, impetuously threw themselves upon our retreating forces. Received at the point of the bayonet, they persistently fought at close quarters: until the Shirvanski reserve battalion, half a squadron of dragoons, and the rocket sotnia, supported by the artillery, at last dispersed them. Our forces re-occupied the ground in front of the outer defences held prior to the assault, and the firing ceased at the close of day. Under cover of the night the troops were withdrawn for about two-thirds of a mile, and the

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entire column was concentrated within one encampment. The enemy did not reappear throughout the whole night, and not a single shot disturbed the still darkness.

"Before dawn of the following morning (10th of September) it was discovered that the Tekkes had turned off the water supply from the main irrigation canal, which was found to have run dry. Coupled with our severe losses, and encumbered by a large number of wounded, this circumstance rendered an immediate retreat inevitable; and before day-break the column decamped to return to the aûl of Karry Kariz, a march of six odd miles, where good water was procurable for the sick and wounded. The enemy did not stir, and Karry Kariz was gained without further mishap. There our casualties were ascertained to reach the high total of 453, *viz.*, killed seven officers and 170 men, wounded twenty officers and 248 men, and missing eight men;* whilst the much reduced provision stores could not land the column nearer to Chikishlar than Band-i-San, unless replenished from the base. On the face of these facts it was decided to march back on Beurma, and after a day's rest in Karry Kariz the troops set out westwards accordingly, marching by easy stages of seven to eight miles a day. The Tekkes did not re-appear, and Beurma was safely reached on the 16th of September.

Meanwhile the camels employed to bring up transports from the Caspian had been falling in such numbers—hundreds were perishing daily—that the idea of wintering the troops in Beurma, Band-i-San, or Hojam Kala, had to be abandoned. Hence the Akhal Tekke oasis was evacuated and the expeditionary forces resumed their return march, reaching Ters Akan on the 2nd of October. There General Tergukassof, the newly appointed Commander-in-Chief, reviewed the retreating column, expressing his satisfaction with the health and bearing of the troops. But the complete disorganization of all transport arrangements, resulting from the enormous fall of camels, compelled General Tergukassof to give up all further thought of resuming operations there and then, and the troops were sent back *via* Duz Oloum to Chat and Chikishlar for the winter season.

* The total strength of the column amounted to 2,467 infantry, 850 cavalry, 271 artillery and 202 militia, or in all, to 3,790 men. But of this number only 3,024 men (inclusive of 134 staff and senior officers) were actually engaged on the 9th of September. Hence the Russian casualties make up a loss of 15 per cent., that is, *more than one-sixth.*

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UNITED SERVICE INSTITUTION OF INDIA.

NOTICE.

The Council having decided to present a Gold Medal for the best Essay on "Military Deductions to be drawn from the late Campaigns in Afghanistan" make known the conditions of competition.

1. The candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 Pages of the Size and Style of the Journal.
3. Essays must be received by the Secretary on or before the 1st May 1881.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto, written on the outside and the name of the candidate inside.
5. The Essays will be submitted for decision to referees chosen by the Council.
6. The name of the successful candidate will be made known at the Annual meeting and his Essay will be printed in the Journal.

By Order of Council,
A. D. ANDERSON, CAPT., R. A.,
Honorary Secretary.

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As Journals are returned from the Dead Letter Office with effaced addresses Members who do not receive the numbers in succession are invited to intimate the same to the Secretary.

By order of the Council,

A. D. ANDERSON, CAPT., R.A.,

Honorary Secretary.

SIMLA,
July 1880.

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NOTICE.

MEMBERS of the Institution who have not already done so, are earnestly requested to pay their arrears of donation and subscription.

Officers who may wish to become members are requested to be kind enough to forward their donations and subscriptions at the same time as they express a wish to join the Institution.

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The address book is corrected up to date from the Army Lists, but mistakes are occasionally unavoidable, unless members themselves promptly notify their change of residence.

Members proceeding to England on leave, who wish the Journal to be forwarded to them while absent from India, should inform the Secretary, and send stamps for the postage.

When a member appears in orders for leave to England, his Journal is not despatched unless he asks for it, and while absent from India his subscription is not payable unless the Journal is supplied.

Members on return from furlough can obtain the numbers of the Journal that have been published during their absence, by paying the subscription for that period, and all members on returning to India should inform the Secretary of the fact.

The Secretary will be happy to send an index to Volumes I, II, III, IV, V, VI, VII, and VIII, to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Honorary Secretary.

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ORIGINAL PAPERS.

I.

"THE NILE AND ITS POLITICAL INFLUENCES,"

BY SIR SAMUEL W. BAKER M.A.,F.R.S.,F.R.A.S.,F.R.G.S. &c., &c.

His Excellency the Marquis of Ripon K.G.,P.C.,G.M.S.I.
in the chair,

Introduced the Lecturer as follows:—

"It is my pleasing duty to introduce to you the distinguished "gentleman who is about to lecture to us upon this occasion. Those "who take any interest in the researches of a famous traveller, in the "stories of a successful sportsman, or in the description of the manners "and customs of distant people by one who is a great master of style, "are well acquanted with the career and pursuits of Sir Samuel Baker. "There is, perhaps, a special reason why I should have readily accepted "the proposal which was made to me to occupy the chair on this "occasion. A good many years ago I filled the office of President of the "Royal Geographical Society, and at that time explorations in the "interior of Africa were being made by one of Sir Samuel Baker's "forerunners, and I took a special interest in the researches connected "with the course of the Nile and in the country through which it flows. "Under these circumstances I felt I should do right to yield to my own "natural impulse, and accept the proposal made to me to take the chair "on this occasion. I have the pleasure to introduce to you my friend "Sir Samuel Baker:—

THE POLITICAL INFLUENCES OF THE NILE.

Sir S. Baker in opening said that, in the history of this world, there have been particular geographical points which, owing to their peculiar position,—favourable for commerce, favourable also for the mental and physical development of mankind,—have become most important. In olden times the civilization of the world was confined to the Mediterranean.

The eastern portion of the Mediterranean, which comprised Tyre and Sidon and the whole of the coasts of Syria and Asia Minor, with

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the island of Cyprus, was commercially the most important centre of the world as it was known at that period. If we looked back, we should be struck with the extremely limited knowledge of what was then called the "world." In the numerous vicissitudes and the rise and fall of empires some have disappeared or decayed, while others, which, like Great Britain, were positively unknown, have become great. But there is one spot which has never changed—a spot of paramount interest in ancient days, and, if possible, of still greater interest at the present day. This country is Egypt; and we find that, notwithstanding the series of conquests by strangers and the desolation of successive wars, there has been a superlative power in that wonderful river, the Nile, which has re-established the prosperity of the nation.

In considering Egypt and the great Nile which has formed it, it is first of all necessary to regard the geographical position; and we find that, as a strategical military point, Egypt could be dominated by a superior maritime power, and, if in possession of that power, Egypt would be practically invulnerable, bounded as it is on the north by the Mediterranean, on the east by the Red Sea, and entirely protected on the west by the enormous deserts of Lybia and Sahara, and upon the north-east by the desert from Palestine. Practically, therefore, a power which commands the sea would always be able to hold Egypt.

But the meeting had little to do with Egypt as it is at the present moment: they must commence with the distant past. In the first place they had to regard Egypt from a geological point of view. Its geological formation belongs to the most recent period, and the cultivable portion which is now called Egypt *par excellence* is due for its existence entirely to the deposit of mud by the Nile which has formed the Delta. The latitude of Egypt and its climatic influences are so favourable to agriculture, that it has always been a land of great fertility, even while other countries, though rich, were suffering from periodical famines. At those times visits to Egypt of historical importance were rendered necessary in search of grain, the traders being drawn to that vast granary by the dearth in their own land, which proved the agricultural importance of ancient Egypt. We find that the first notice of Egypt in the Bible is upon the visit paid by Abraham, 1920 B.C. Owing to the great famine in Chaldea, Abraham and his wife steered their way towards Egypt even at that great distance of time, 1920 years before Christ! The great Chaldean was so appalled by the magnificence of Egypt and the luxury and civilization to which he was entirely unaccustomed, that he thought it expedient to pass off his wife for his sister lest he should be murdered for her sake. From the time of Abraham that Nile has never practically changed. Although every year it varies from its course to a small degree, still there was evidence, which no one could possibly contest, that those people who attribute the creation to 4004 B.C. must practically be in error. We know that in Egypt there are at the present moment standing temples more than 4,000 years old; we see their foundations are unchanged; and we know that the Nile

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used to wash, or nearly washed, those foundations 4,000 years ago. So that practically the river remains as it was when they were built. At the same time we observe near these ruins dry water-courses showing that at some more remote age there was a rainfall, and that the climate must have altered before those temples were erected. We pick up fossils in the stream-beds, and we know that these reliable leaves from Nature's own history prove that organic matter existed in those early periods, which completely upsets all popular chronology. The priests of Egypt showed to Herodotus 2,300 years ago their written history independent of their traditional accounts, and proved to that great historian's satisfaction that from upwards of 10,000 years before their time they traced their kings in an unbroken line of descent.

The Egyptian priests were well aware that without their Nile Egypt could not exist. That river, always the great mystery, was the only strip of water which, passing through 1,300 miles of inhospitable deserts, had formed the Delta and the agricultural wealth of Egypt. A country possessing such abundant wealth, together with such favourable conditions, was an attraction to the cupidity of surrounding nations. Egypt was attacked and won by the Persians, and subsequently by the Greeks and Romans. Whenever Egypt was afflicted by famine, the calamity was due to a deficiency in the volume of the Nile which, whether grave or slight, was invariably chronicled and became historical.

After full investigation of the course of the Nile we may be almost certain that the famine in the time of Joseph was caused by some obstruction in the river, or by a deficient rainfall in Abyssinia which, interfered with the average volume in lower Egypt. When Herodotus was in Egypt he had superstitious reverence for the Nile; and in his writings, whenever he approaches the subject of Egyptian theology, he endeavours to avoid the mysterious topic. But the priests of Egypt were unanimous in attributing a supernatural mystery to that river. They had no clue to the unknown sources; they had no idea of the cause of an overflow during the summer months, when other countries suffered from drought. Hence their theology and want of geographical knowledge heightened their superstitions to such a degree that every creature which inhabited this sacred river was reverenced. The ibex, the goose, the crocodile, and other creatures were all regarded as holy. The scarabæus (beetle) was also reverenced by the Egyptians. In the lecturer's opinion, this insect was regarded as the harbinger of the Nile, as he had himself noticed that these very large beetles appeared at the commencement of the rains.

When Herodotus was in Egypt his great desire was to discover, if possible, some clue to the sources of the mysterious Nile, and to the great but secret cause of the rising of the waters. But the more he sought for information among the priests, the more vague their account became, until, at last, he was obliged to relinquish his inquiries. When

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the Romans conquered Egypt, Julius Cæsar proclaimed publicly that if he could only solve this great problem and discover the sources of the Nile, he should consider it the greatest conquest he had made. Nero sent two centurions in command of a large expedition. Sir Samuel thought he knew with tolerable certainty the neighbourhood which they reached. Seneca's description of that expedition is exceedingly graphic. There was neither open water nor land to be seen. Sir Samuel felt perfectly certain that in the time of the centurions' expedition their must have been the same vegetable obstruction which caused him so much difficulty in his last ascent of the river, where for fifty miles he was obliged to cut his way through this mass of accumulated vegetable matter, exactly resembling the *paludes vastas et immensas* of Seneca. He had seen the water bubbling up with such enormous force from beneath the mass that it called to his recollection this exact description of the centurions.

Such was the state of the Nile when the general ignorance prevailed among the priests, and it was regarded with mysterious reverence. If the Nile rose, the people feared an inundation which might sweep away half of Egypt; if the Nile decreased, they dreaded a famine. Hence all their thoughts were concentrated upon this one river, upon which the actual existence of the people must depend.

The exports of Egypt in 1879 were £13,000,000 against £8,000,000 for an average Nile in 1878, thus showing the enormous recuperative power of one wholesome inundation.

The great question from time immemorial regarded the secret sources of the Nile in order to obtain some clue to the causes of the abundance or scarcity of its waters. The energy and intelligence of the Egyptians had at an early period constructed a ship-canal from the Nile to the Red Sea. This left the Nile at Bubastis, and followed a course near to the present fresh-water canal of this day. The date of the first canal is unknown, but it silted up, and was re-opened by Darius. It was on a scale sufficiently large to admit of two triremes rowing abreast. The Phœnicians went through the canal into the Red Sea, and this commenced the first circumnavigation of Africa; and, in fact, the whole commerce of the Red Sea was carried on at an early period of the world's history through a canal which, with certain modifications, has become the modern highway to India.

It is interesting to look back to the old maps of Ptolemy, and notice the very striking fact that he marks two lakes in equatorial Africa as the sources of the Nile, and the real sources are very much in the positions occupied by these two mythical lakes. Ptolemy must have gained a vast deal of information from the Arab traders, which assisted him in his researches. The Arabs were the oldest travellers known except the Phœnicians. When Ptolemy was living in Egypt he was in commucation with Arabs who traded *viâ* the Red Sea with Zanzibar.

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The Arabs had thus visited these equatorial lakes, but the information they gave him was vague and unsatisfactory in the absence of scientific observations. Nobody believed in the sources of the Nile until James Bruce, of Kinnaird, started from England as an independent gentleman and explorer. His object was to discover the Nile sources, and he discovered, without any doubt, the sources of the Blue Nile. But when he arrived at the junction of two Niles at Khartoum he was so struck with the magnitude of the Great White Nile that he honestly acknowledged the inferiority of the Blue Nile, and gave credit to the superior importance of the Great White Nile. For many years the French, Italians, Portuguese, and the Egyptians under Mahomed Ali Pasha, had made various attempts to discover the true sources of the Nile, but they were far from successful.

At that time there were two Indian officers, Captain Burton and Captain Speke, who started on an expedition from Zanzibar to search for the Nile sources. The Portuguese, many years ago, had also started from the west coast of Africa on a like expedition; but the English had been very behindhand in African discoveries. Livingstone had done a great deal in the south by the Zambesi, and this great explorer no doubt gave the first impulse to English exploration in Africa. Burton and Speke discovered the Tanganika Lake, and (Burton being sick at the time) Speke alone pushed forward upon the route reported by the Arabs to the Victoria Nyanza, he feeling certain that this must be the great source of the Nile. Speke, having left Burton, after a very interesting trip, arrived at the great lake and after the discovery he returned to England in company with Burton. This was the commencement of English discoveries in Africa. But on his return, Speke made another important discovery, that he had intruded himself into a geographical hornet's nest. His theory was discredited in England, and even by Burton, who, of course, had been too ill to accompany his friend in his search. Sir Roderick Murchison, who was President of the Royal Geographical Society, exclaimed:—"My dear Speke, you must go back again and complete the sources of the Nile!" Speke started a second time for Africa in company with another Indian officer, Captain Grant. These two went to Zanzibar, Speke commanding, and commenced *bonâ fide* a Government expedition to search for the Nile sources. Speke was Sir Samuel's old friend, and he knew the determination of his character. Still Sir Samuel felt sure that as no one succeeded in the attempt, there might be difficulties that would be insurmountable. It struck him, however, that as Speke had started from Zanzibar and was going to work his way to the north, he (Sir Samuel) might assist by starting from the Mediteranean and work his way to the south; and he calculated the chances of their meeting in Central Africa by working from opposite directions, and looked forward with a secret hope to the chance of finding Speke in some difficulty from which he could relieve him and Grant. In 1860 Speke started from Zanzibar, and in 1861 Sir Samuel left from the Mediteranean. He had Herodotus with him, and Bruce's excellent book of travels. The latter

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made the task apalling, and frequently in the interminable deserts he had looked into himself. and thought how presumptuous he was to imagine that he could accomplish what every one else had failed in bringing to a conclusion. Still he had a certain advantage in independence. He was not employed either by a Society or a Government. His time was his own, and the journey was at his own cost.

Sir Samuel Baker then proceeded to give an account of his journey, starting from Cairo in the spring of 1861, together with Lady Baker, in search of the Nile sources, with the expectation of meeting Captain Speke's expedition from Zanzibar. He traced the source of the Nile through the Indian deserts for 1,200 miles without an affluent, and showed the tremendous loss of water by absorption and by the evaporation during the summer heat in an atmosphere so dry that writing paper crumbled in the hand like a withered leaf. He then described his arrival at the Atbara river, the first affluent, which in June was a dry bed of sand, about 400 yards wide and 30 feet in depth. Observing the importance of this river during the rains, he determined to examine it to the Abyssinian sources, and to determine the hydrography of the Nile tributaries of the Abyssinian mountain ranges. Upon following up the course of the dry bed of the Atbara river, fringed upon either Bank by palms and the green foliage of mimosas, like a winding serpent in the yellow desert of boundless sand, he witnessed the sudden arrival of the flood on a calm starlight night with a cloudless sky. The river filled half-bank full, bringing down a ruin of bamboos, trees, &c., in its muddy flood, raised suddenly by the setting in of the rains some hundreds of miles distant in the mountains of Abyssinia.

Sir Samuel then described his explorations of all the rivers of Abyssinia, including the Atbara, Settili, Royan, Rahad, Dinder, and the Blue Nile. These rivers flow through valleys which they have cut after their descent from the mountains in their passage through flat plains of rich alluvial loam. The Atbara, known by the ancients as the Astaboras, or Black river flows through a valley of two or more miles in width, and about 200 feet below the level of the flat table-like plains of loam. All the cubic contents of these broad and deep valleys have been delivered in Egypt by the river in the shape of mud to form the Delta, and are still accumulating as silt in the Mediterranean.

Sir Samuel passed twelve months in exploring the Nile tributaries of Abyssinia, and descended *viâ* the Blue Nile to Khartoum in north latitude 15° 30′. When there he fitted out a large expedition for the White Nile, consisting of three vessels well-manned, with an escort of armed followers and 27 transport animals, the whole of which he disembarked at Gondokoro, north latitude 4° 54′, in good condition, 1,400 miles from Khartoum. Here the expedition met with great opposition from the slave traders, who use the place as a depôt for their slaves. At length, after some weeks, Sir Samuel was here suddenly joined by Speke and Grant, who had marched through Africa from Zanzibar, having proved the Nile to issue from the Victoria Nyanza.

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Sir Samuel described the enthusiastic meeting with Captain Speke, who reported the existence of another great lake to the west of the Victoria which he had been unable to visit, but which held an important position in the Nile system. This lake Sir Samuel determined to discover before he returned to England. He supplied Speke with his vessels, and all that was necessary to convey his party to Khartoum, and then he and Lady Baker commenced their perilous advance to the south, which after two years terminated in the discovery of the Albert Nyanza, and the proof that the Nile, after entering from the Victoria, Nyanza, issued from the Albert Lake as the complete river.

Sir Samuel summed up the description of the hydrography of the Nile by accrediting the Nile tributaries of Abyssinia with the mud-carrying and inundating power which has formed and which still fructify Egypt; but he explained clearly that the average volume of the Nile is sustained throughout all other seasons by the steady flow from the great equatorial lakes which receive at all seasons a rainfall both from the south and the north of the Equator. He remarked at some length on the immense political and agricultural importance of Egypt to England as the great commercial centre and as the highway to India. He explained the great cotton-producing power of Egypt, and mentioned the interesting fact of the first introduction of the cotton cultivation into Egypt by seeds from the Soudan (where it is indigenous) so recently as in the reign of Mehemet Ali Pasha.

The lecturer prophesied a brilliant future for Egypt when engineering science should control and render navigable the waters of the Nile, so as to ensure a regular supply to Lower Egypt, which by opening the rich loams of the Soudan to a cheap means of transport, and by the extension of cotton cultivation, should render England independent of America.

After paying a fitting tribute to those explorers who had led the way from the south, Sir Samuel laid forcible emphasis upon the fact that England alone had succeeded in the difficult enterprise of a search for the Nile sources; and he concluded in these words:—"When we parted at Gondokoro, I had promised my friend Speke that I would work out the portion which he had left incomplete and that I would not return until I had explored the lake now called the Albert Nyanza. Alas! upon my arrival in England I stood with his old father by the side of my friend. I could not tell him that his great work had been completed. Speke was an Indian officer; Burton and Grant were also Indian officers; and these great explorers sustained and increased the influence of Great Britain in all those countries through which they passed by exhibiting those features of character universally attributed to English men, *viz.*, patience, perseverance, and unflinching determination. Those are the qualities of a race that has conquered, will civilize, and will ever maintain the vast Indian Empire."

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His Excellency the Viceroy then made the following remarks:—

"I think that Sir Samuel Baker's statements have been so clear
" and full, that (although I am quite sure nobody regretted their length)
" there are left to us no questions to ask him; and I feel that I shall
" interpret your feelings rightly if I should express to him, as I now
" do, my best thanks for the interesting lecture he has given us—for
" bringing before us so graphically and instructively the nature of the
" country, the circumstances of the Nile and its natural history, and
" also for reminding us of those features of our national character
" of which we are so justly proud *viz* the enterprise and determination
" of Englishmen."

The proceedings were here brought to a close.

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II.

THE DEFENCE OF THE NORTH WEST FRONTIER.

By Colonel Medley R.E. *Consulting Engineer to Government for Railways and late Superintending Engineer, Punjab Frontier Circle.*

A paper read at the Institution Rooms on the 4th August 1880.—Brigr. Genl. W. G. Dunham Massy *in the chair.*

No one, I think, here present, will be inclined to underrate the importance and interest of the subject to which I have invited your attention this afternoon. It, however, involves so many side issues, that I was somewhat doubtful, until re-assured by the Council, as to how far it was a proper subject for discussion here; for, it is impossible to consider the question of the Defence of our N. W. Frontier without more or less discussing the subject of our trans-frontier policy, or, what have come to be called in India, by a curious mis-use of words, *political* questions, meaning thereby, questions of foreign policy only.

Now, on these, in the present instance there is, as we all know, a great diversity of opinion; I shall however, endeavour as far as possible to confine my remarks on such points, strictly to the question at issue, and in discussing opinions conflicting with my own I will at least try to state them impartially.

The only grounds on which I can fairly ask your attention to my remarks are, that 17 years of my service have been passed in the Punjab, and that I have a good personal acquaintance with our old frontier down its whole length, having served for 4½ years on the Derajat border before the Mutiny and recently having been Superintending Engineer of the Frontier Circle, from Huzara up to Peshawur and down to Dera Ghazee Khan.

The battle of Goojerat, fought on the 21st February 1849, and the subsequent surrender of the Sikh Army at Rawul Pindi to General Gilbert, terminated the independence of the Punjab, and Lord Dalhousie resolved to annex the whole of the Sikh dominions to the British Empire. In spite of our alleged greed of territory, this annexation was not resolved upon without considerable reluctance. Three years before, after the campaign on the Sutlej, the Sikh empire lay equally at our mercy, and an attempt was made at a medium course, whereby our influence should be asserted and maintained, but the state should be left nominally independent. The revolt at Multan and second Sikh War were the results of this attempt at a compromise, and it is as well we should bear this instance in mind. No experiment was ever made more honestly or with a greater determination to make it a success. The state was to be nursed and taught by selected British Officers, who

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were to guide the Sikh Chiefs in the way they should go for a certain number of years, until the young Maharaja should attain his majority, when he would take over the Government, himself. The plan might have been a success, if we had had military occupation of the whole country. Unfortunately, we had no army except at Lahore, and this benevolent arrangement lasted as far as our guns could protect it and no farther.

Annexation having been determined on, history has recorded with what admirable energy, firmness and statesmanlike forethought the measure was carried out, and how quickly the most turbulent and warlike nation that we had ever encountered in India, settled down under our rule into peaceful and contented subjects.

Those were the days of government by men rather than measures, when men were proud to declare themselves disciples of the Lawrence school, when those two great brothers and their equally great chief, Dalhousie, stamped something of their own individuality and energy on all serving under them, when health, strength and even life were freely sacrificed by many who worked on, day after day, in spite of heat and discomfort and loneliness, anxious only to do their duty and to win the approbation of their chiefs. I do not say that such a system is needed now or that it would be wise to recall it; but if ever the day comes for the further extension of our Indian empire, the system by which the pacification of the Punjab was accomplished should not, be forgotten by our rulers.

One of the first points to be settled was, of course, the military occupation of the new province. Large cantonments were to be built at Lahore, Peshawur, and Rawul Pindi, and smaller forces were to be maintained at Mooltan, Jhelum and Wuzeerabad, which was shortly changed to Sealkote. At Multan, the old native fort was retained as an Arsenal, but a large new fort was subsequently designed here to take the place of the great Arsenal at Ferozepore which was to be given up, a measure which was discussed for many years but which has never been carried out. A smaller Arsenal was maintained in the native Fort at Peshawur, a most inconvenient place, being close to the city; this has since been removed to the new Fort at Rawul Pindi, on a site which seems to have been chosen at hap-hazard, and which is certainly a very objectionable one. At Peshawur, various defensive works were subsequently proposed for the cantonment, and discussions went on for many years, but nothing has ever been done.

The question of Forts and defensive works is no doubt a difficult one in India. A large Fort requires a large number of men to defend it, who are generally much better employed in fighting the enemy in the open, and there is an instinctive feeling that if ever we have to shut up our armies in forts it will be time for us to walk out of India. But Forts are at any rate required for our arsenals; and defensible accommodation is at least wanted, in times of emergency, for women and

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children, invalids and non-combatants, and the problem of how to provide these at proper places and under proper conditions is one not easy of solution.

The question of the internal communications of the country was also not likely to be neglected by such men as Henry Lawrence and Robert Napier. The Punjab, like most Asiatic provinces under native rulers, was singularly destitute of roads. Following the Roman rule, therefore, the first step taken was to push on the Grand Trunk Road, which had already reached Ferozepore, to Lahore and thence to Wuzeerabad, Jhelum, Pindi, Attock and Peshawur. The construction of this great Engineering Work was entrusted to Lieut., now Lt. Genl., Sir A. Taylor by whom it was commenced, carried on and completed—as it stands at present—one of the finest roads in the world.

Numerous Kucha, or fairweather, roads were in a short time carried out all over the province, but at that stage unfortunately they have been allowed to remain; and the Punjab at this day, after 30 years of occupation, is very deficient in roads worthy of the name—that is metalled and bridged and fit for wheeled conveyance. In fact, the Western Punjab is almost entirely isolated from the Eastern,—a fact which we shall have to consider when we come to the question of the defence of the frontier.

At a very early stage, the question of Frontier Defence was naturally forced upon our attention, and it will now be convenient to describe that frontier, and to show what measures were determined on for its defence and how these were carried out.

The Northern and Western frontiers of the Punjab, then, seemed defined by Nature, as they politically existed—being the foot of the mountain ranges that formed the natural boundary of the Province and rose almost abruptly out of the plains. To the continuous line of frontier thus defined, measuring 800 miles from the Jhelum to the frontier of Sind, there were only two interruptions—one, where the hilly district of Huzara was included in our territory jutting out as it may be said to do, into the plains—the other, where a spur of hilly country runs down to the Indus, cutting off the direct communication between Peshawur and Kohat.

The first of these interruptions in the continuity of our border line in the plains was treated by the simple expedient of permeating the district by good roads—one being carried from the Grand Trunk Road through the heart of the district to the Kashmir border—another at right angles to it, running through the Hills from Murree to Abbottabad. Other minor roads were also made; the result being that what had been one of the most troublesome districts under Sikh rule, soon settled down under good government to as peaceful a condition as any of our older districts.

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But the other intercepted portion of hill country, between Peshawur and Kohat, was a much more difficult problem to solve—indeed it remains unsolved to this day. It was not deemed expedient to occupy it, being part of the Afreedi territory,—and the consequence was that we have been exposed to the humiliation of the direct road between two of our most important frontier stations, via the Kohat Pass, being held subject to the pleasure of a band of hill robbers, who have constantly closed it and compelled us to make a long circuit round, and who have entirely refused either to keep it in good order themselves or to let us do it for them, though they are paid a large sum annually—nominally for that very purpose, really as black mail for a right of way through the pass.

The Pass itself, through which I have often ridden, is not a formidable one except at the Kohat end, where a *Kotal* or spur obstructs the valley and has to be ascended and descended by a zig-zag. At the foot of the descent on the Kohat side is Fort Garnett, where a small garrison is always kept from the force at Kohat 3 miles off. On the Peshawur side, the road runs for 18 miles through the plains to Muttunnee and thence for 6 miles, over stony undulating ground, to Aymul Chubootra, at the mouth of the Pass, where a police garrison is kept. The road used formerly to go past Fort Mackeson where a military force is always retained. The Pass itself is about 18 miles long, is generally wide and open, and as I have already said is by no means formidable.

The frontier from Peshawur to Huzara is defined by the line of road generally parallel to the Hills and connecting the out posts of Michnee, Shubkudur and Abazai, which are garrisoned by troops from Peshawur—and thence running across to Hotee Murdan in the Eusufzaie district, where the Guides are always quartered in time of peace. There is a police post at Oghi, some 12 miles in front of Hotee Murdan, which again is 15 miles in advance of the Nowshera Cantonment, on the Trunk Road, with which it is connected by a fairly good road. From Murdan, the frontier road runs to Torbela on the Indus, where the great river first emerges from the hills—and from here a patrolling road is carried over the hills close to and this side of the river, which here forms our boundary, the famous Black Mountain rising up abruptly on the other side.

Let us now see what the arrangements were, and are, for the 400 miles of western frontier between Kohat and Sindh. The great military road runs through the valley from Kohat to Lachee, and thence through the hills of the Salt range to Buhadoor Khel, where a large fort was built to retain control over the salt mines. Thence the road is continued to Luttumah, where it leaves the hills and where we have a military post, and on through the plains for 22 miles to Bunnoo (or Edwardesabad as it is now termed) on the right bank of the Koorum. The whole distance from Kohat to Bunnoo is about 90 miles.

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From Bunnoo, the main road goes through the plains, generally parallel to the river, to the Peyzoo Pass, at the foot of the spur on which is the sanatarium of Sheik Boodeen ;—there is another line of road however, at the foot of the hills connecting a series of police posts, which, if attacked, could easily be supported from Bunnoo.

The Peyzoo Pass is the northern boundary of the Derajat, which forms a strip of country of varying width between the Indus and the Suleiman Hills, and extends down to the Sind border, a length of 250 miles.

A continuous line of small Military posts, 10 to 15 miles apart connected by a fair weather road, is carried along this frontier, the cantonments of Dera Ismael Khan, Dera Ghazi Khan and Rajunpore being in support in the rear and close to the river The whole country, being flat and open, is favorable for the action of cavalary, and the frontier road is regularly patrolled by sowars from the posts. The posts themselves were, when practicable, built near the mouths of the passes leading into the plains, but their sites had to be fixed with reference to the possibility of procuring water. A few of the passes afforded a perennial stream, as at Vehowah and Hurrund,—but generally the supply was from wells old or new. At one post the well was 220′ deep, at another 150′; often too the water was brackish—In fact in such a country, this question of water supply is a very difficult one and greatly limits the choice of what might otherwise be good military positions. The posts themselves consist of a square enclosure surrounded by a mud wall, against which are the barracks, on the roofs of which is a musketry parapet. In one corner of the post is a 2 storied tower, detached from the rest, in which half a dozen infantry could easily defend themselves while the cavalry were away.

The defence of the border, from Kohat to Sind, was committed to the charge of the Punjab Irregular Force, which consisted of 6 Regiments of infantry, 5 of Cavalry and 3 batteries of artillery. The designation of the force was subsequently altered to the Punjab Frontier Force—the Guides were added to it, and some regiments of Sikhs and Goorkhas,—and the Head Quarters were fixed at Abbottabad in Huzara.

The Punjab Irregular Force was under the orders of the Local Government *i.e.* the Chief Commissioner, or (as he afterwards became) the Lieutenant Governor, of the Punjab, who was thus charged with the immediate defence of the whole Frontier, except in the Peshawar valley, where the Cantonment and out-posts were garrisoned by regular troops under the orders of the Commander-in-Chief.

This state of affairs was a sore subject with Sir Charles Napier, and in the military sense was no doubt an anomaly. Its justification lay in the fact that our system of frontier defence was not entirely one of military force, but was rather a combination of policy and strength which required, to carry it out, a force capable of being wielded at the discretion of the Government immediately responsible for the peace of the

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frontier. Like many other anomalies too, its defence may be safely rested on the practical success which attended it, not only at first, but for the 30 years during which it has been worked.

The officers of the Punjab Irregular Force were generally young and carefully selected men—a statement which will scarcely be gainsaid when the force included such names as Chamberlain, Keyes, Coke, Wilde, Browne, Watson, Probyn, Charles Nicholson and others. For some years, the officers commanding Regiments had magisterial powers, and could not only dismiss men at their own pleasure, but could sentence any malefactor to two years' imprisonment with hard labor. They were all well acquainted with the language and held constant and friendly converse with the frontier chiefs. At Kohat, for some time, the chief civil and military control was held by the same individual, Colonel John Coke, who was Deputy Commissioner of the District, and also commanded the 1st Punjab Infantry, still known as Coke's Rifles. John Nicholson was Deputy Commissioner of Bunnoo, Captain (now Sir R. Pollock was Deputy Commissioner at Dera Ghazi Khan, Major James was at Peshawur. Subsequently and fortunately for India, Herbert Edwardes was Commissioner there at the time of India's greatest need.

The men of the regiments were recruited partly from the Frontier tribes, but chiefly from Punjabees generally. A few Poorbeahs or Hindustanis were however taken, and the cavalry were indeed largely recruited from that source, The infantry were generally armed with the 2 grooved rifle, the cavalry with sword and carbine or pistol. Of the batteries, at first two were ordinary Light Field horse batteries, consisting of five 9-prs. and one 24-lbr. howitzer. The third was a Mountain Mule 3-lbr. battery and all were made so afterwards.

The Frontier service was in many respects a peculiar one; the regiments served solely across the Indus and were relieved only between their own stations, Kohat, Bunnoo, Dera Ismail Khan, Dera Ghazi Khan and Asnee. No European troops were ever seen by them, and for years no ladies were allowed to cross the Indus. I remember Lord Dalhousie depriving one officer of his regiment who had ventured to bring his wife across in violation of this rule, and various jokes were current at the time as to the emotion displayed by Piffers at the unexpected sight of an old petticoat, &c. Every regiment kept up its own carriage and was ready to take the field at two hours' notice, and the annals of the border, record with what gallantry and efficiency the many frontier campaigns were fought. Those interested in the subject should read Colonel Paget's narrative of these campaigns drawn up by order of the Punjab Government, which contains the history of eight considerable expeditions and 28 minor ones, many of them of the highest interest to the student of mountain warfare.

The Border territory thus guarded by our troops may be said to consist generally of a series of low barren hills, the only roads or passes into which are the dry beds of the mountain torrents by which the

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drainage from the higher ranges finds its way into the plains. Except the Peshawar valley watered by the Cabul River, and the Bannu valley irrigated by the Koorum, the country at the foot of the hills is generally barren and thinly populated, a precarious cultivation being maintained by an occasional rush of water down the passes, which is skilfully utilized to the utmost by the inhabitants of the few border villages. It is not until we come down to the district of Dera Ghazi Khan that the river overflows its banks and the levels admit of canals being cut to irrigate the fields for some distance inland.

Now a few words may be said about the frontier tribes against whom our defensive arrangements were framed. From the north down to the Dera Ghazi Khan district, the tribes are all Pathans; downwards to Sind they are Beluchis. Without troubling you with a long list of names, it may be briefly said that the Mohmunds, the Afreedies and the Orukzaies are the most powerful tribes on the borders of the Peshawar valley and the Kohat Pass, that the great clan of the Wazeeries holds the hills opposite Bannoo and Dera Ismail Khan, and that the Bozdars, Khetrans and Murrees are the most considerable of the Belooch tribes in the hills opposite the lower Derajat. The whole of the tribes were computed to be able to turn out 170,000 fighting men, indifferently armed it is true, with matchlocks and swords, and altogether without artillery, but possessed of some of the best qualities of soldiers, such as personal bravery, endurance and fidelity to their chiefs, and inhabiting a country, the excessive ruggedness of which presented the greatest difficulties to the operations of a regular force.

It must not be supposed, however, that these tribes are nothing more than bands of hill robbers. Many of them, especially the Wuzeeries, are carriers and traders, bringing iron, horses, dried fruits down to the plains in the cold weather, or even working in large gangs on the roads, and then returning to their homes in the hills by the beginning of the hot weather. But the general poverty of their country and long hereditary custom, with them as with the Scotch Highlanders of 140 years ago, made them look upon their lowland neighbors as fair prey, while cattle-lifting was regarded as an honorable and manly pursuit.

The general system of dealing with these tribes for many years was as follows—We did not claim them as our subjects, and therefore never interfered with their internal disputes, unless occasionally when the district officer was asked to act as peacemaker. If they attacked our frontier villages, or lifted cattle, or committed any outrage on our border, the cavalry of the nearest posts turned out and did their best to punish them, often cutting them off on their return, or overtaking them before they got to their hill fastnesses. On the occurrence of any such outrage, the offending tribe was called to account by the Civil officer, and if any subsidy was payable to them for the custody of the passes, the whole or part of it was stopped. If no satisfaction could be obtained, or the offence

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was repeated, the tribe was outlawed, the men being forbidden to come down into the plains and being imprisoned if they did. This measure often brought them to reason as it put them to great straits, stopping their trade and preventing their getting supplies of such articles as were unprocurable in the hills.

But if all other measures failed, and repeated outrages showed that the tribe had fairly thrown down the gauntlet, then an expedition was sanctioned. A force of from 2 to 5,000 men entered the hills, if possible, about March before the crops were ripe, the villages were burned, towers blown up, crops destroyed, and the force remained in the country marching about, until the leaders came in and submitted. Then a durbar was held, the list of their offences read out, compensation exacted in money, cattle or goods, and hostages were generally taken to reside under surveillance in the plains.

In this manner the Hussunzaies were punished by Mackeson in 1853, and by Wilde in 1868, the Mohmunds by Sir Colin Campbell in 1850-51, the Afridies in several expeditions between 1850 and 1867, the Mirunzaies and Orukzaies in 1855-56, the Wuzeeries by Chamberlain in 1859-60, and the Bozdars by Chamberlain in 1857.

As a rule, it may be said that, in these expeditions the justice of our proceedings was generally recognised; the other tribes stood aloof and let the offending tribe fight it out alone. In the Umbeyla expedition, however, through some misapprehension of our motive in entering the country, the tribes were thoroughly alarmed and roused, a temporary check gave them confidence and at one time it seemed probable that we should have the most formidable combination to contend with that we had ever faced. As it was large reinforcements had to be sent up, the fighting was very severe and the campaign did not close without our suffering considerable losses. It was quite the most serious of our frontier campaigns.

Looking at the whole line of the Western frontier defence, it may be said that the weakest part of the arrangement was in the isolated situation of the five Frontier stations on which the line of posts depended for their support owing to the insufficient state of the communications. In other words, there was no Reserve (or at least no available Reserve) for the supports—while the supports could not often have supported each other, so bad was the state of the connecting roads. Kohat if attacked, could not be supported from Peshawur with the Kohat pass closed, its only Reserve was at Rawul Pindi, 100 miles distant, with which it was connected by a bad road scarcely practicable for wheeled conveyance and crossed by the unbridged Indus at Khooshalgarh. Bannoo and Dera Ismail Khan had absolutely no reserve behind them, except far distant Rawul Pindi to which there is no road worthy of the name; they would have to be relieved by troops going down the Indus in boats from Attock. Dera Ghazi Khan though only 50 miles in front of Multan has two great unbridged rivers between. Rajanpur is altogether isolated.

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The road down the frontier connecting these cantonments was cut up by mountain torrents and often impassable for days together, and it was a source of perpetual anxiety to the Frontier Engineers to keep the main line of communication in decent order with the small sums of money annually placed at their disposal.

Fortunately, the tribes with whom we have to deal, though formidable enough in collective numbers and certainly not destitute of warlike qualities have hitherto been incapable of appreciating the weakness of our situation and of concerting measures to take advantage of it. I mention the theoretic weakness of the system, because in such a discussion one is bound to take notice of it, but it is a weakness of detail only; it does not invalidate the merits of the system itself of which it is impossible to deny practical success.

Never for one moment has our hold over the frontier in all these 30 years been doubtful, never once has the enemy ventured into the field to attack one of our frontier cantonments: Kohat is the only one that has been seriously threatened. The raids on our border have certainly been numerous if all be reckoned up, but the great majority have been cases of cattle-lifting, and the burning of Tonk, about a year ago, may be said to be the most serious of the frontier raids. But, excepting a short breadth of debateable land immediately on the border, it may be fairly said that the whole of the frontier districts have been entirely free from outrage for more than 20 years, and that the land is cultivated and the cattle grazed as safely in the Derajat as in the district of Umballa.

To the quietness of Hazara I have already alluded. Peshawar and the Yusufzaie valley have been almost as secure, though there have been occasional instances of outrages even in our very cantonments, when there were not wanting those who complained of the undue leniency of our laws, and Government was urged to stern and vindictive measures of summary justice such as were rife when Avitabile was the Governor of Peshawar. Yet, if we number such instances as those of the murder of Mackeson, Adams, Macdonald and a few others, and recollect that they were spread over a space of 30 years, we shall not, I think, consider the number large.

It would be absurd, however, to attribute the quietude of the Frontier Districts, entirely or even chiefly, to the completeness of the military protective arrangements. It was rather to the sense of security and justice enjoyed by the people who, under the preceding rule, had lived in a state of constant alarm and oppression; it was to the wise, kindly and impartial operation of good laws ably administered; to the measures taken for the encouragement of agriculture, trade and education, that we owed the gradual settling down into peaceful and industrious habits of a hitherto lawless and reckless population. The people felt they were under the rule of a strong and just Government

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and the results were what they always have been when British has succeeded to Native rule,

After nine years of such progress the war cloud of the great Mutiny burst over the land and then was seen the effects of a wise and good Government. The Frontier Province which had hitherto been a source of anxiety and the cost and revenue of which had often been contrasted with those of the richer Provinces of India, now proved a tower of strength when those provinces revolted from us. The danger was so terrible when the troops at Peshawar revolted and we seemed threatened by a formidable invasion from the hills, that for a moment even the firmness of John Lawrence gave way, and he discussed the propriety of giving up the dangerous Peshawar Valley to the custody of the Afghans and retiring behind the Indus. Fortunately he had counsellors at his elbow who knew that there was no danger for us in India so great as the danger of retreat. Our line of frontier was maintained, the loyal border chiefs were called upon for aid, and freely responded, stern chastisement was dealt upon the revolted troops, the native regiments that had so ably defended the frontier were sent, as many as could be spared, to join the Delhi Field force, and to replace them and the revolted regiments, 70,000 soldiers were raised in the province the population of which not ten years before had been our most dreaded enemy. The history of that war tells how well the Punjab Cavalry and Infantry redeemed our trust, and how freely they gave their lives to enable us to reconquer Hindustan; and those regiments now form the great nucleus of the new Native Army.

The Mutiny made little or no change in the frontier system, which it was felt had worked well. When it was over, the frontier regiments returned to their stations and every thing went on as before. The Punjab shared with the rest of India in the impetus given to various useful works; the Railway was completed from Lahore to Mooltan subsequently from Lahore to Delhi, thus completing the line of communication between the Punjab and Bombay, and giving it an imperfect, but still valuable connection with its own port of Kurrachi. Statesmen, Philosophers, Soldiers and Newspaper writers assured us that the Indian Empire had at last reached its natural limits, further extension in any direction was strongly deprecated, and we were again and again enjoined to concentrate our energies on the improvement and good Government of what we had won at the cost of so much blood and treasure.

Meanwhile, the increasing progress of the Russian conquests in Central Asia had not been unobserved. But forty years had elapsed since Alexander Burnes and his contemporaries had sounded the note of alarm in this direction. The result of that alram had been the Afghan War, the saddest and most shameful chapter in British Indian history, and we had no fancy for opening, chapter II. It was a long time before any proposal that promised to embroil us again with Afghan politics was seriously listened to or had a chance of success. But circumstances at

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length changed or at least were said to have done so and a series of negotiations began whose object was avowedly to restore British ascendancy in Afghanistan.

Into the history of those negotiations I do not propose to enter; they are foreign to the purpose of this paper. I will only say that by the reception of the Russian Embassy at Cabul in 1878, and by the positive refusal of the Ameer to receive a Mission from us, the British Government felt itself insulted and defied, and considered it its duty to go to war. The immediate object of that war would appear to have been to compel the Ameer of Cabul to do what he had often refused to do *viz.* to receive a British Resident at his capital. But besides this concession, which was extorted from him by the famous treaty of Gundamuck, another was it appeared to be obtained. Our old Frontier which had served us so well for 30 years, was suddenly discovered to be "unscientific" and to need rectification, and when the treaty was signed and proclaimed, and we took out our maps, then we discovered *how* it had been rectified and what was meant by a "scientific frontier".

It appeared then that our scientific frontier consisted of three places in Afghanistan, distant respectively 50 and 500 miles from each other, totally unconnected with one another and approached from the base in rear, 100 to 200 miles distant, through three mountain passes, which on a very moderate computation would require some 15,000 men to defend them. I am not now saying that a strong case cannot be made out for occupying these places; that we will enquire into presently. I only say that three such isolated positions can hardly be said to constitute a a frontier in themselves, while as outposts to the old frontier so far in advance of the base, the advisability of such a rectification must at least be supported by very cogent arguments to justify it.

Let us, then, examine the defects of the old frontier and see whether a case can be made out for such a radical change or addition to it. The old frontier was, as I have already shown, a clearly defined line, which had practically answered well for 30 years, and whose theoretic defects were easily remediable by an improvement in its communications, lateral and to the rear. And as a defence against the hill country, for which it was intended, it was all that was required.

The real objection made to it was, however, that it was not a proper line of defence against an invasion from Afghanistan; and as was alleged, that the hills acted as a screen, behind which we might be ignorant of what was going on, while a formidable invading Army was preparing ready to burst through the passes at any points they desired. Admitting this view of the case, the question is, how and at what cost it could be remedied? There are clearly but two ways; the first, to hold the crests of the hills, or at least, a certain number of strong points along them, and to connect such points by good roads, laterally and to the rear. In this way, the command of the whole hill country would be held, including the passes, and an invading army would have to conquer that before

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it could march onward. This is no doubt a very effectual way of attaining the desired ends, but at what a cost would it have to be carried out! It is hardly an exaggeration to say that it would ruin India. It would require a series of lengthened campaigns against the whole of the frontier tribes, and then the permanent occupation of their country by a large military force, until at any rate the new forts were built and the whole country permeated by military roads. It is possible that we may have to do this some day, bit by bit, for, as in the case of Hazara, it is the only way of effectually quieting a mountain country, but I think it will be agreed that the revenues of India may be more profitably expended in other directions for many years to come.

Well, then, the second way is to do what the Gundamuck treaty proposed *viz.* to hold the principal passes themselves at both ends, which implies also the holding of the intermediate portion. This however is an imperfect way of doing the werk, because unless all the passes are held, the enemy can make use of those which are not held, and so nullify the whole of our arrangements. This is what occurred in the Balkans during the last Russo-Turkish War, when the Russians marched through one of the minor undefended passes and then by a flank movement shut up the Turks in one of the passes which they were holding, and from which they only extricated themselves with the loss of half their army.

However, granting that we shall not be caught napping in this way and shut up like rats in a trap, there can be no doubt that the holding of such passes as the Khyber and the Koorum will be a very costly affair. It has already been difficult to find proper positions for our posts in the former, owing to the great heat and unhealthiness of the climate, while in regard to the Koorum, the communication is avowedly imperfect, being blocked with snow for 4 months out of the 12. As for the third pass, the Bolan, it has already cost us a railway 130 miles long to the mouth of the pass, and we are busy making the rest, having moreover attained our right of way in this direction by simple treaty before the campaign commenced. Then it may be pointed out that so long as the surrounding country is not in our occupation, it is quite impossible to tell how large a force we shall require to hold these passes. Khyberies and Mohmunds are not very fond of running their heads against stone walls and good posts are not likely to be attacked, but they might easily be blockaded, and then a moveable column must be kept for their relief. As yet the hill people have been professedly our friends, whether from fear of our guns or love of our rupees, I cannot say, but it is obvious that a line of communication of this kind cannot be held on their sufferance.

And then comes the question, with what object is all this expense to be incurred? If we want to go through the Khyber Pass at any time we can force our way through as we have done before; why go to the expense of maintaining a continuous right of way which we may so

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rarely have occasion to use? It is quite certain we do not dread any invasion from the Afghans themselves; they have never yet made anything of a stand against us in the open field, in their own country, and are certainly not likely to invade India; the border tribes themselves are a far more formidable foe. No the invading power we fear is of course Russia, and it is against Russian Armies that all our precautions are to be taken.

And here I cannot help saying that I think it is a pitiful role for us to play, to show so continual and senseless a terror and jealously of a power like Russia. If Liberty is greater than Slavery, if the united strength of a free people is stronger than an overgrown and straggling despotism, if there is any truth in those principles of freedom and good government of which England has ever been the champion and representative, then is it childish for us to fear for one moment the result of a collision with such a power as Russia, and those writers who keep alive such a puerile terror do but slander their own country and show how little confidence they have in the result of the conflict between civilization and barbarism. But Russia has in truth as important and useful a destiny to fulfil as ourselves. Asia is wide enough for both, and we ought to welcome her conquest over such savages as the Turkomans as at least one step on the road to progress and enlightenment.

Supposing, however, that all our fears are justified, that Russia has secured Merv and Herat, that Afghanistan has been subjugated, or is at least completely under Russian influence all of which it may be remarked are rather wide suppositions and supposing moreover that a united Army of Russians, Turcomans and Afghans has been formed for the invasion of India. Of what great advantage are our three advanced posts of observation? Are we to send our armies through these narrow defiles in order to meet the invading army in Afghanistan, where if we are defeated, we should have to fall back through these mountain passes, with the hill tribes rising all round upon us, harassing our retreat and plundering our baggage?

Would it not be much better to reverse such a state of things—to let our invaders first fight *their* way thro' the hills before meeting us in our own territory, in the midst of our resources, with free communication at our back with our true base, the sea, and then to let *them*, if defeated, fight their way back thro' the mountain passes with the tribes harassing them instead of us?

But it may be said, at any rate we secure three of the main passes leading into India and prevent the enemy from making use of them. That, certainly, is an advantage to some extent and the only one I can see in favour of what is proposed; the question is as to whether it is not purchased at too high a price. For as I have already pointed out.—1st, We can always seize these passes when we want them without spending blood and treasure in retaining them year after year, before we *do* want

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them.—2nd, As a defensive precaution, the measure is ineffectual, because the enemy might and would make use of other passes finding these blocked. On the long line of frontier from the Peiwar to the Bolan, there are a large number of such passes, notably the Gomul, the easiest and most important on the whole frontier, opposite to Dera Ismail Khan and from which roads diverge to Kandahar, Ghuznee and Kabul.—3rd, Instead of locking up a large number of effective soldiers in holding passes to prevent the enemy making use of them, the garrisons of the posts would be far more usefully employed with the main army, ready to fight the enemy on this side of the passes, or in entrenched positions opposite their mouths, as recommended by General Hamley.

It may be said, however, that what is to be feared is, not so much actual invasion, as that Russia should establish an ascendancy in Afghanistan, which would give her an ever ready means of fomenting intrigues and creating disturbances on our frontier. This, no doubt, is a possible contingency, if not real danger, but whether it was worth while to pay such a heavy price, in order to guard against a risk of this sort may well be open to question. At any rate, if it was judged necessary to advance across our frontier for the purpose, the inevitable consequences of such an advance should have been fore-seen and provided for; judging from the trouble *we* had already experienced 40 years ago in establishing our own ascendancy, we may, I think, well have doubted whether the Russians would not have found the task equally hard.

It cannot be too often repeated that the real danger to our Anglo-Indian Empire is from within rather than from without, and that in the prosperity and contentment of our subjects, in the spread of education, and in the development of our vast natural resources, lies our true safety, rather than in further extensions of territory, especially the barren mountains and stony deserts of Afghanistan.

And if it be asked, what other course remained to us? I would say distinctly, *except the retention of our old frontier or the annexation of the whole of Afghanistan.* there was no medium course possible, and that this should have been foreseen. Granted that a strong, united, independent and friendly Afghanistan was a most desirable object, as a buffer between us and Russia, what chance was there of such a vision being realized? We had certainly seen it to some extent, when the country was ruled by the strong and wise Dost Mohamed Khan, but we knew enough of Asiatic and especially Afghan character to know that he was as exceptional a ruler as Runjit Sing, a man to be found once in two or three centuries, but the repetition of whom was no more to be counted on in framing our plans than the probability of another Napoleon Bonaparte in dealing with France.

The fact is, it is scarcely possible that a nation in the peculiar position of Afghanistan—between two great powers like England and Russia, should not look to and lean upon one or the other; only that there is another important factor to be taken into consideration, and

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that is, the savage love of independence and freedom, which with all their treachery, cowardice and cruelty, at any rate, gives one bond of sympathy between us and themselves. So long as the chief of their rival factions can get money or arms out of English or Russians, they are quite ready to make any amount of lying promises and professions; touch but their independence, and their own quarrels are forgotten, in their common hatred of the *Kaffir*, whether Englishman or Russian. All accounts that I have seen agree in this, that with double the number of men employed in this war that we had in that of 40 years ago, we are as far as ever from subjugating the country.

Herein lies the difficulty of our coming to an arrangement with any of the chiefs. The mere fact that any chief is a nominee or even a protégé of ours, would at once destroy his claim in the eyes of his countrymen, as effectually now as in Shah Soojah's case, and if in addition to that, he had consented to the dismemberment of the kingdom by the separation of Kandahar, it may be safely said that his life would not be worth a week's purchase.

It may be said that such a people are not very promising subjects for annexation. It may, however, be replied that annexation has certain great advantages over a merely temporary military occupation. In the latter case you have the whole country against you, or at least none willing to take your side, for they will have a bad time of it when you are gone. But if you declare for annexation, you become stronger at once; all those who have any thing to hope for from a change of rulers, those classes who depend upon trade, all the quiet and well disposed, who appreciate the advantages of good roads, safety from assassination and plunder, and good government generally, at once come over to your side, not perhaps openly, but really, though secretly. Asiatics, sooner than most men, accept the inevitable, perhaps because they are fatalists. The Punjab is a striking instance of how quickly and completely a warlike people, after being fairly beaten in battle, will settle down under the rule of a stronger race not sulkily, but cheerfully, and with a considerable feeling of pride in the connexion. I see no reason to doubt that the Afghan would do the same, would be as ready to enlist and make an equally good soldier as the Punjabee, and would, if the whole population were disarmed and the country covered with good roads, if in short the same means were made use of that were so effectual in the case of the Punjab, settle down like his cousin the Punjabee, into a peaceful and contented citizen.

But there is no denying, it would be an expensive and troublesome task, and in a pecuniary sense, not worth the money. The country is poor, and the construction of roads, forts, cantonments, jails, kucherries and the other concomitants of Anglo-Asiatic civilization would cost a great deal of money, which would have to be provided by the older provinces with very small gain to them; and there is moreover the strongest objection of all, that the intervening hill country does not

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belong to us, and that our communications with Afghanistan could not be maintained, as we have seen, without great trouble and expense.

No one therefore wants to annex Afghanistan, and if we can terminate the present state of things without doing so, no doubt we shall; but if so, I see no safe course but to fall back on our old frontier, and it is doubtful whether that is a feasible course now. As I have already said, there is no danger for us in India so great as the danger of Retreat. It is the fashion of a certain school of modern politicians in England to laugh at the word prestige, but we in India are alive to its full significance. It seems to be a law of our existence in India that we cannot go back, and this should make us all the more cautious of going forward. My own conviction is that it is now too late for repentance; we may patch up a peace now and retire behind our mountain barrier lamenting the anarchy we have left behind us, and the money we have so uselessly squandered; but very few years will elapse before the inevitable march of events will force us again to the front, and we shall see that there is no way out of it but the conquest and annexation of the whole kingdom of Afghanistan from Kabul to Herat.

If there *be* a medium course, that is undoubtedly the retention of Quetta, possibly even of Kandahar, as an advanced military post, completing the Kandahar Railway as quickly as possible; but this will only be a step in the direction of annexation, and if we take this step we should be prepared for what follows, for it will most certainly lead to it.

The fact is that there is something irreconcileable between European and Asiatic ideas of Government, which makes their co-existence incompatible with each other. Separated, they get on well enough; when brought into contact, the weaker goes to the wall. The very fact of a British occupation, disguise it under what name we may, excites and arouses antagonistic elements which can only be allayed by annexation, and that is what must inevitably happen at Kandahar or anywhere else.

Meanwhile, the present war has incidentally brought us one or two great advantages. First, it has brought out the excellent qualities of our troops, and more especially, perhaps, our native troops, in a manner which has exicited the admiration of all. The patience, willingness and bravery that has distinguished them under circumstances of great hardship and prolonged absence from their own country, ought I think, never to be forgotten.

The campaign has moreover given to a large portion of the army, an experience in mountain warfare which hitherto has almost been confined to the Frontier Force. If it has at the same time shown us many defects in our system of Transport and Commissariat, the service accomplished will be no mean one, if we only profit by it.

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Last, not least, it has forced upon us the necessity of completing Railway communication with the frontier, at a much earlier period than would otherwise have been effected. Extraordinary efforts have been made, and it is hoped that before the close of this year the railway will be opened to Attock and Khooshalgurh, while the construction of the first section of the line to Kandahar, or the 140 miles from Sukkur to Sibi, have nullified the terrors of the Kuchee Desert that guarded the approach to the Bolan. I hope still to see another important line carried out, *viz.* the extension of the Salt branch line lately opened, across the desert between the Jhelum and the Indus, to a point opposite to Dera Ismail Khan, thus giving a communication between the East and West of the Punjab, a ready means of support to our frontier posts,—and a military line to the Gomal Pass, the largest and easiest on the whole border. There is no one who knows the extraordinary civilizing value of the Locomotive, who will not own that this progress of the Railway will perhaps more than anything else contribute to the future efficiency of the Defence of our North Western Frontier.

At the conclusion of the lecture the following discussion then took place:—

Captain Collen said:—"I could have wished, Sir, that some more competent member of this Institution had risen to open the discussion, which I feel sure will take place on the very interesting and instructive lecture which Colonel Maisey has so obligingly read in the absence of Colonel Medley. But I shall, in the hope of inducing others to follow in my somewhat presumptuous footsteps, venture to offer a few remarks.

"The first point which struck me in Colonel Medley's paper was his statement that the anomalous frontier system "which has hitherto obtained, has proved a practical success." To my mind it certainly has been a decidedly practical success for the tribes, but a very partial success for ourselves!

"Colonel Medley gave us an account—or at least he mentioned the trades in which many of these tribesmen, these men of war, engage; but I scarcely think he dwelt with sufficient force upon that prevailing trade in which they engage, the trade pre-eminently their own, which they carry on profitably and extensively, the trade of bloodshed and robbery. These peaceful traders, first cousins to the peaceful villagers of Afghanistan about whom we hear so much in the Home papers, but so little of in the country itself, are free to come and to go in our cantonments, they are free to plunder us in our markets, and free to plunder us on our borders. But let us now turn to the reverse of the picture. It is dangerous for a British officer to ride from post to post without an escort. The neighbourhood of the cantonments is unsafe, and the cantonments themselves at night are insecure; while shortly before the present war began, the strange spectacle was presented to the world of

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one of the largest cantonments on our Frontier being in a state of blockade!

"Then again, we have made during the past 30 years numerous small expeditions costing a good deal in money and a good deal in blood, and not always ending, I think, in "peace with honor." We have not, I imagine, always returned from the hills triumphantly, and in very frequent instances, I understand from the records of these expeditions, that we were saluted as we retired from the mountains in a manner not altogether friendly.

"Of course this aspect of affairs has a humorous side, and I think that the frontier tribes have a very keen sense of humour! I recollect hearing a story when I was at Bannu of an occasion on which the Waziris carried off two commissariat bullocks. A few days after committing the theft, they returned one of the animals to the Deputy Commissioner with a message that they had unfortunately eaten one of the bullocks and found him very tough, and that they returned the other as he was the most expensive animal in his food they had ever tried to keep.

"There was another passage in Colonel Medley's lecture, which I shall ask your leave to comment upon, and it was, that the old frontier was a *well-defined line*, and that its *disadvantages* were only *theoretical*. Now I feel that I can hardly assent to such a proposition when I have just listened to a clear and lucid statement of what I must call the remarkable practical disadvantages of the old frontier. I allude to the want of communication, the want of supports, the cutting off of two great frontier stations by a tongue of land inhabited by a hostile tribe, characterised by Colonel Medley as "a band of mere hill robbers;" when I remember the constant repressive expeditions of the last 30 years; and when I recollect the insecurity of life and property on the principal border of Her Majesty's British Empire.

"Colonel Medley has handled the "scientific frontier" very severely. I must say he has almost maltreated it! (cries of no! no!) But I see from the dissent expressed that the scientific frontier has "no friends" now, though it had many not long ago, and Colonel Medley has, I think, and very properly too from his point of view, "hit it hard." I am not a special advocate of the scientific frontier. Personally, I rather agree with the correspondent who telegraphed to his paper "I am now on the scientific frontier," and added, "I hope I shall soon be *off* it." But I think there *are* certain advantages in the scientific frontier which Colonel Medley has not quite sufficiently put before us. In the first place, the three advanced posts of that frontier are isolated certainly, but not more so than the salients of a fortification, and, as Colonel Medley himself pointed out, it is scarcely fair to call three advanced positions a frontier in themselves. The Khyber is, of course, the great gateway on the route from Cabul to India, and the three positions certainly give us the power of advance, and have very considerable local advantages in enabling us to get to the rear of the tribes—a proceeding

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which the tribes have a remarkable dislike for. Whatever the fate of the Khyber and Kurram may be (and I have no partiality for the Kurram myself), I sincerely trust that we shall maintain Quetta and Pishin as a strong and permanent position, a position which gives us in a very high degree the power of advance, should such a step ever be required of us.

"In regard to the remarks Colonel Medley has made about Russia, I think we shall most of us agree with him. But at the same time we must remember that we can never allow Russia to establish herself in Afghanistan in any way whatever, even though we should have to check her influence in that country at the risk of postponing, for a time, those blessings of Russian civilisation, which Colonel Medley suggests that the Turcomans should receive. The invasion of India is, of course, an interesting military problem, but it really is not one of any great practical importance to us in the present day; it has, at all events, a theoretical importance, and viewed as a military problem, I consider it would be better when the time comes that we should fight Russia beyond our frontier rather than within it; in fact I go further and assert that the real battle, if it ever is to be fought, must be fought either in Asia Minor, or in Europe.

In my opinion the defence of the north-west frontier rests (1) on our power of advance, (2) on our possessing good communication by road, railway and telegraph, (3) by our power of mobilising, not only the frontier forces, but a much larger force, and the real defence of India and her frontier rests in our preparation for War, whether it be on a large or a small scale.

"My criticisms of Colonel Medley's paper may appear to be somewhat ungracious, but if that gentleman had been present tonight, I should have thanked him for his most interesting lecture, and should have said to him all that I have said to you. I feel that I have taken up quite enough of your time, and I have little more to add. In regard to the last point, the question of annexation, I, for my part, sincerely trust that we shall never waste the finances of India on such a step. On this point, and in conclusion of my remarks, I shall ask you to let me read a few words from a memorandum written by Lord Wellesley to Lord Ellenborough in 1842, when the latter was coming out to India to take up the reins of government, words which seem to me as applicable now as then. "Your Lordship, I am satisfied, would reject Afghanistan and Cabul, with their rocks, sands, deserts, ice, and snow, even if Shah Shujah had bequeathed them as peace offerings to England, although, perhaps, the ends of criminal justice may require the presence of a British force there for some time."

Captain Sawyer would like to notice one point in the remarks which had just been made by Captain Collen. Colonel Medley, in his paper, animadverted on the isolated positions of the three points which had

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been selected for the "scientific" frontier. Captain Collen, in reply, had compared these points, isolated as they were, to the salients of a fortification; but it was well known that the salients of a fortification should be within the fire and support of one another. In the case of the three points, this was far from being so, and the speaker did not see, therefore, how Captain Collen's simile was applicable. In conclusion, he would say, that up to that time nothing had been said at the meeting, which recommended the "scientific" frontier to his humble judgment.

Colonel Medley's lecture on the defence of the North West Frontier.

Captain Anderson said—In the very interesting paper we have heard read it is pointed out that there are but two courses for us to select from with regard to Afghanistan, *viz.*, annexation of the entire country, or a return to our old line of frontier; there is, however, in it a remark which shows that another line of action, the occupation of Candahar and its connection with India by a line of rail, had attracted Colonel Medley's notice. This intermediate move, I would beg to point out, was advocated by General Hamley at the commencement of the campaign, in the following words: "I think our position vastly improved by the occupation of Quetta, but I should think it all we could desire, if we occupied Candahar."

Strategically, this action commends itself to us because all our advances westward must have for their base, Kurrachee, Bombay and the Sea, with left for the pivot. To have the pivot line of advance for several hundreds of miles firmly secured, and to be strong all along that line (for we can only for the present look on Candahar as an advance post) would at all times be of the utmost importance. To be weak on our left (the Candahar line), or to suffer reverses on that flank, would mean disaster and much possible trouble, while so long as our left be firmly established, it matters little what may befall us on our right (the Cabul line). Practically, I believe, an immense majority of those who have seen the country are unanimous in the opinion that Quetta is but a half-hearted measure and that Candahar is the key of Southern as well as of the greater part of the remainder of Afghanistan commanding, as it does, the roads in every direction, situate in a fertile part of the country, and inhabited by Afghans who only require to be certain of the permanency of our occupation, the value to us of a strong advanced post in that locality, for offence or defence, cannot be over-estimated. Last, but not least, financially, few schemes, at the outset, bear on the face of them better omens of success. Should we annex the province of Candahar or instal our nominee to rule over it, the revenues arising therefrom might with much justice be required to furnish a grant for the support of our troops stationed there; while the completion of the railway would, owing to the extreme difficulties of camel transport through hilly inhospitable regions, draw and increase the already very large

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trade of Southern Afghanistan in wool, skins, dried fruits &c. I regret having been unable to procure any reliable recent information as to the trade between Afghanistan and India, but the following figures of that in early years are interesting. The value of the wool trade export from Afghanistan is shown, in 1852, as Rs.17,000, while in 1862 it had risen to Rs.31,50,000. The value of the exports from the districts of Cabul, Tirah, Bajaur and Siwestan into the Punjab was estimated as follows, 1873-74, 21 lakhs; 1874-75, 57 lakhs; 1875-76, 100 lakhs. These figures may possibly not be quite accurate, but they suffice to show the very marked and regular increase of the trade between the two countries.

On military grounds a railway requires no advocacy. I believe it will ere long be an accepted rule, that all military advances will have to be accompanied or closely followed by the construction of a line of rail. Had this been realised as a necessity in our advance on Candahar in July and August 1878, the line might now have been near completion, and its cost amply recouped by the numerous savings it would have given rise to in other ways; while it is needless for me to point out the more than invaluable boon it would at this moment have been to us had we been in a position to push forward the troops scattered along the Sukkur-Candahar line, and to land portions of the garrisons of Kurrachee, Mooltan and Mian Mir, in Candahar, within the space of five or six days.

The cry will, I know, be raised, that this occupation is but dread of Russian invasion; it is not so much that, as acting up to what I submit should be our watch word "Prepare."

In common now-a-days with many others, I firmly believe, that at this moment Russia has no more desire to go to war with us, or to extend her frontiers, than we have to do the same by her, but neither of us can help ourselves. Just as the 2nd Act of the 2nd Afghan War, with our occupation of Cabul and retention of Candahar, was forced upon us by the massacre of our embassy, so has the 2nd Russian expedition, now moving from the Caspian on Merve, been necessitated by the Geok Tepe disaster. As Sir Henry Rawlinson said the other day "Russia is proceeding on a far more deliberate and carefully organised plan on this occasion." She too has realised the necessity of a railway and is preparing to lay a line of rail from Krasnovodsk to Kizil Arvat. That Russia will eventually occupy Merve, in spite of the difficulties of the operation, no one doubts, and that she may possibly be forced to retain it is very probable, the results being, for her, greater command over Northern Afghanistan than we from Quetta could exercise over Southern.

Europe is at this instant but one vast banked-up fire, that may blaze forth at any moment, in which flame if England and Russia become enveloped, they will justifiably interfere with each other in Central Asia.

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On this point the Duke of Argyll in his "Eastern Question" writes: "The British Government was of course quite right to take every measure in its power to defeat Russia if it contemplated the probability of a war with that Power. But if the government of England had a perfect right to make such preparations and to devise such plans, it will hardly be denied that Russia had an equal right to take precautions against them. It is true she had an engagement with us not to interfere in Afghanistan. But it will hardly be contended that she was to continue to be bound by this engagement, when the Viceroy of India was known or believed to be organising an attack upon her of which Afghanistan was to be the base."

While Lord Beaconsfield speaking in the House of Lords on the Stoletoff Mission and the Russian preparations at that time, said, "I will say of the expedition which Russia was preparing at the time when she thought war was inevitable between our country and herself, I will say at once, *I hold that those preparations were perfectly allowable.*"

That on this point, history will again repeat itself, is as true as that we are here; that Russian interference in Afghanistan, which brought upon us the first Afghan war, which with other circumstances was prominent in bringing about this Afghan war, will, when occasion arises, be again resorted to, and with similar results, is almost equally certain; and for this we must be prepared.

Preparation means saving of life, time, labor, and money, an old maxim, severely taught us by our advance on Candahar in 1878, and to ensure this, no scheme as yet put forward appears to hold out to us such prospects of success from a military, political or financial point of view, or to be so little likely to disturb the peace of the Afghan Kingdom, as the occupation of Candahar.

General Olpherts had the pleasure to attend the lecture at the United Service Institution in London alluded to by one of the members present here, and although he was quite unprepared for what General Hamley was about to say on that occasion, he had thought it necessary to record his opinion, and he was sorry that General Sir Edwin Johnson, who was to have presided here to-day, was not present, for Sir Edwin had attended the meeting in London and would have borne him out in saying that what he then stated was received with enthusiasm and with the approval of the majority of those who were present. They would find in the records of the London United Service Institution a full account of General Hamley's lecture and all that was stated on that occasion by those present. Briefly, General Olpherts stated that our only true policy in order to secure our frontier was to take Afghanistan and keep it, and that opinion, so far from having been in the least degree shaken by any subsequent events, has been greatly strengthened thereby. Since then we have taken possession of those two important points in Afghanistan, Cabul and Candahar, quite as easily as we expected we should do. Since then we have tried to form a "scientific frontier." Now he believed

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that whoever coined that phrase did not know the meaning of it himself: He believed it was simply a phrase used in a political sense.

Since then the Treaty of Gundamuck had proved to be a failure. Our Envoy had been assassinated and this was the second of our Envoys who had met with such a death there: and we have advanced and taken possession of Cabul. We have also secured Candahar: and the only point we require to consolidate our power in that country, is, Herat. And now it was advocated that we should give up Cabul and retire, after sacrificing our money and the lives of so many gallant fellows, and leave it to the vile creatures (laughter and applause) who were a disgrace to humanity according to their present mode of life. When General Hamley put forward his idea of holding Candahar and leaving Herat and Cabul, he was sorry he did not dispute that point with him. He also stated that the future great battle between England and Russia should be fought in that equilateral triangle formed by the three points of Cabul, Candahar, and Herat. General Hamley had not rightly appreciated the situation. To allow the Russians to enter into Afghanistan would be a most fatal measure, and Sir Henry Rawlinson stated that rather than Herat should fall into the hands of Russia he would imperil the safety of India. General Olpherts thought that the taking of Herat by us was a very simple measure, and he believed that, if General Roberts conld meet Ayoub Khan, he would defeat him easily. If General Roberts could accomplish this before Christmas, the speaker asked, as the price of his advice, to be allowed to take what was left up to the Russian frontier, and he would undertake that we would before long have garden parties with the Russians on the Oxus, while the English ladies could then go over and complete the conquest over them. (Applause and laughter.)

Captain King-Harman, after the lecture, submitted the following remarks which he was unable to deliver at the time.

Formerly we had a Frontier line; whether it was a good or a bad one, I am not prepared to say. We in reality took up the old Sikh frontier and there we remained: anyhow it was a more or less distinctly marked line, the greater part of which was entrusted to the guardianship of the Punjab Frontier Force, and the remainder to that of the famous Scind Force, which Colonel Medley forgot to mention, and although the lateral communications were bad, while those to the rear were worse and there were no reserves, yet the means of defence were suited to the times. The means of communication havebeen, and are still being much improved owing to the construction of the Railway, but much more is required to make them anything like perfect. For instance the Frontier road from Kohat to Rajanpore is at times impasssable, and, as we have heard Kohat is cut off from Peshawur by a tongue of land belonging to an independent tribe of blood-thirsty robbers who hold the Kohat Pass and who, though receiving black mail in the shape of a large subsidy from the British Government, close the road to us whenever it suits them to do so.

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I gather from Colonel Medley's able lecture that he is in favour of one of two courses, either the complete annexation of Afghanistan or the return to our old frontier line; but he shews us that the latter course is impossible owing to the loss of prestige which it would entail, and I think the former is most objectionable, if not also impossible, for two reasons: first, Afghanistan could not be annexed and occupied without treating the intervening country inhabited by the Afreedies, Momunds, Wuzeeries and others in the same way, and at the same time we should probably also find it necessary before long to occupy Cashmere on one side and the territories of the Khan of Khelāt on the other; and after all this had been done at incalculable cost, we should then have to make a new frontier line.

Secondly, in occupying the whole of Afghanistan we shall be far removed from the Sea which is our real base, and though certainly Railway communication would be much extended, yet it must be remembered that absolute reliance cannot at all times be placed on the inhabitants of the countries through which the lines would run.

As we now stand, we have the old frontier with the addition of three strong advanced posts from which we cannot now go back, and the next step which will have to be taken, and for which there is no time like the present, will be to annex the countries intervening between these posts; that this step will have to be taken sooner or later is well known to all, and we shall never again have such an opportunity as the present for doing the work thoroughly and at the same time cheaply. Recent events have proved that our left must be advanced to Kandahar at the least, but before pushing on as advocated by General Olpherts, we must strengthen ourselves up to and at that point.

Our position in the Kurrum Valley is sneered at and good reasons have been adduced for doing so, but it must not be forgotten that by being strong there during these last two campaigns we have been such a thorn in the sides of the Wuzeeries and Afreedies as to have almost entirely rendered those tribes powerless for the time being. Having then our strong left well advanced up to Kandahar and our right front strong and level and slightly advanced from, though at the same time closely connected by Roads with, the main country, we shall be in the attitude of defence of a Prize fighter and ready for anything that may turn up.

The only way tribes, such as those we have mentioned, can be thoroughly subjugated, is, by completely crushing them and overrunning their country from one end to another and back again with an overwhelming force, and the only way to keep them in subjection is to establish foreign Colonies in their midst on confiscated land under the protection of strong fortified posts; large Colonies of Goorkhas or Dogras at and about Terah, of Khuttucks, or Mooltanees in the Wuzeerie

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country and of Sikhs, Jâts, or Rajpoots, in the Kurram Valley would soon produce the desired effects, but such colonies must be treated in the most liberal manner at first starting and be given a sufficiently large track of country to enable them to extend. Not in the way the Goorkha Colony at Abbottabad has been treated.

General Massy said that he quite agreed with General Olpherts in thinking that there was no sort of difficulty about our taking possession of Afghanistan, but it was very doubtful if the game was worth the candle. The possibility of a Russian invasion of Afghanistan he thought a very remote one, owing to the difficulties which they would have to encounter. He had had several conversations with Afghans who declared that, hard as they had fought against us, they would fight against the Russian harder still if necessary—that much as they hated us, religious toleration and humanity were preferable to the yoke of Russian despotism. But the natives of India were keenly watching us, and if we retired at this stage, they would naturally say that we were obliged to do so. At the same time General Massy's opinion was that the holding of the Kurram Valley was an utterly useless measure, for we now see 8,000 men shut up in it unable to advance to relieve Candahar. In a military point of view there is absolutely no object in holding the Kurram, but it is necessary, in order that we should not lose *prestige*, to continue to hold it until we can arrange to make it over to some friendly Chief, while having a large force at Thull for the purposes of advance might be all that would be necessary. He perfectly agreed with what Captain Anderson had said about Candahar and the importance of occupation.

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III.

THE "COLLINSIAN" 2ND PRIZE ESSAY.

GOOD AND BAD STABLE MANAGEMENT WITH ITS RESULTS.

INDIGESTION IN ITS CAUSES AND THE BEST MEANS OF PREVENTING IT.

BY

VETERINARY SURGEON A. E. QUERIPEL.

(*Continued from No. 44.*)

PART II.

We shall now proceed to consider the second portion of the present paper viz:—The diseases and accidents to which Troop Horses in India are liable from irregularities of digestion, their direct and indirect causes and the best available means of preventing them, and in doing so will have to remark upon, Water, its qualities &c. and to ask ourselves the question, What is food and for what purpose it is given. We shall then consider the chemical and physiological properties of the various kinds, their fitness or otherwise for maintaining horses in health also the best method in which they can be given. Having shewn this it will next become our duty to point out the effects which climate and seasons exercise on our patients and then to proceed to the study of the various diseases arising from the above. Before however doing this I feel it will be necessary to study the anatomical and physiological peculiarities of the various structures entering into the process of digestion as without this knowledge it will be impossible to shew how the different kinds of food are acted upon or how these organs become affected from various causes.

The first of a series of changes which food undergoes during its course through the body, takes place in the mouth. Here it is first subjected to the action of the teeth, which consist of incisors and molars in the mare, to which we must add tushes in the horse. The use of the incisors of horses in a state of domestication is secondary to that of the molars, as they are not compelled to nip off their food as they would have to do were they living in a free state. The molars are therefore the teeth that demand the greatest consideration for it is with these that the food is ground and prepared to undergo the necessary changes which enable it to be afterwards assimilated. These teeth are

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termed compound, that is they are composed of three distinct structures varying in density, and hardness, a wise provision of nature to ensure the more perfect trituration of the food. It will not be necessary to enter into the composition of these different materials but hereafter when speaking of disease I shall shew how frequently indigestion is caused by the teeth being either organically or mechanically affected.

The palate consists of two parts, the hard and the soft, the basement structure of the former is of bone covered by a firm dense substance elevated into several ridges known as the Bars, the whole covered by Mucous Membrane and plentifully supplied with blood. I allude to these structures as it will be necessary to refer to them when speaking of lampas. The soft palate may be looked upon as a prolongation of the hard. From its length in the horse it is enabled to reach the larynx and thereby divides the cavity of the mouth from that of the nostrils,-hence it is that vomition through the mouth cannot be effected in this animal. The tongue in addition to its being the organ of taste, assists in the disposal of food during mastication, any thing therefore interferring with this organ must lead to derangement of the functions of digestion.

The most important change which food undergoes in the mouth is that of being mixed with Saliva, the effects of this must be divided into mechanical and chemical. Let us first however consider the manner in which this fluid is secreted and how it flows into the mouth.

These important secretory glands consist of 3 pairs placed on either side and are termed Parotid, Submaxillary and Sublingual.

The Parotid the largest and most important of the three lies at the upper part of the head, having the branch of the lower jaw in front and extends from the root of the ear to the angles of the jaw. It consists of numerous small bodies or lobules united together and in these the fluid is secreted, each lobule possesses a small tube, the unison of the whole of which form the parotid duct which penetrates into the cavity of the mouth about the second anterior Molar tooth.

The Submaxillary the next in size, lies between the angles of the jaw and is of similar construction to the parotid. Its duct leaving the centre of the gland courses its way under the tongue until it opens upon the Frœnum and the two small eminences vulgarly called the Barbs are the mouths of these ducts.

The Sublinqual, the smallest pair of the three lies, as its name implies, under the tongue. The ducts of these glands, for they are numerous, issue *from the upper surface and having ascended perpendicularly* open into the mouth close to the frœnum.

In addition to the above there are numerous smaller bodies capable of secreting Saliva these are spread over the lips, cheeks, soft

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palate and root of tongue but into the anatomical features of these it will be unnecessary to enter.

The mechanical functions of Saliva are assisted by the secretion of the Mucous membrane lining the mouth.

It may be asked whether even such a cursory description of these structures, as is contained above, was necessary. My reply will be in the affirmative, for it will go far to prove when speaking on the subject of feeding how important it is that a horse's head should then be in a pendulous position.

Let us now enquire. What is Saliva, how its secretion is increased, and what are its functions.

Saliva is an alkaline, transparent and watery fluid. Its alkalinitd is however greater when digestion is going on and that of the Parotiy duct seems to be more so than that from other glands. It consists of Water 994·10. Solids 5·90. amongst the latter of which is to be found Ptyalin, which is supposed to cause the chemical changes which take place in the food.

The flow of Saliva varies greatly according to the amount and nature of the food taken. Food would appear to be its greatest stimulus, during a period of rest it is only secreted in sufficient quantity to moisten the mouth in conjunction with mucus. When food however is taken, it materially increases and even the sight of food and water by the mental impression caused when suffering from hunger or thirst is sufficient to increase its flow.

Its functions mechanically considered are three.

1*st.* It keeps the mouth moist and assists the movements of the tongue.

2*nd.* It dissolves sapid substances and renders them capable of exciting the nerves of taste.

3*rd.* Its most important use is that of mixing with the food and enabling it to be swallowed. It seems to be so composed that it more readily mixes with food than water does.

Its chemical function is that of converting the starchy portions of food into grape sugar, as for example when common starch is exposed to its influence the grains are cracked and converted into Sugar.

The food, having been masticated and mixed with Saliva, is now fit to be swallowed, let us see how this operation is performed, for the bolus in its passage into the stomach has to pass the posterior opening of the Nostrils, and also that into the Larynx, which is a cartilaginous box at the upper part of the windpipe. Deglutition is partly a voluntary

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and partly an involuntary act. The former as far as the Pharyux but as soon as this latter organ is stimulated and seizes the food, the pellet is beyond the control of the will. In passing the posterior opening of the Nostrils, the soft palate is pushed upwards and closes it against the passage of food, whilst the Epiglottis is closely brought into apposition with the Rima Glothdis by the tongue being brought back with the food, in addition to this also inspiration during deglutition is impossible.

The food is then passed through the Pharyux and Œsophagus, of which little need be said anatomically except that they are composed of muscular fibres lined on their internal surface by mucous membrane which secretes mucus for the lubrication of the pellet during its passage into the Stomach.

Having now arrived at the Stomach, we shall be compelled to make a more minute investigation into its structure, being as it is one of the most important organs connected with Digestion. The stomach of the horse is one of extraordinary small calibre the wisdom of this will be evident when we consider the work and pace which we expect from this animal. The capacity of a horse's stomach is from 3 to 3½ gallons, and when compared with that of a man's, in ratio to their relative weights is only half as great. Into this organ, are two openings, one termed the Cardiac into which the Œsophagus pours the food, the other termed the Pyloric through which the food is passed into the intestines. The stomach is composed of three layers or coats viz: The Peritoneal, muscular and mucous, altho' the latter is occasionally divided into two and described as the Cuticular and Villous, from peculiarities which will afterwards be described.

The Peritoneal is derived from the serous membrane termed the Peritoneum which lines the abdominal cavity, giving it that smooth shining appearance and bedewing it with moisture to prevent anything like friction when the viscera are in motion. In addition to this function, the membrane in question serves to retain the Stomach in its place by attaching it to the Diaphragm, liver &c.

The Muscular coat is of great importance, as by its action the food is thoroughly mixed and is subjected to the various juices secreted by the glandular structure of the mucous membrane. To ensure this end being gained, nature has most wisely provided fibres of different forms which take divergent directions, and the object will be more apparent when it is pointed out, that the left side has three planes and the right but one; true digestion being carried on in the latter, more muscular force was necessary on the left side to propel the food forward to the right. In addition to these uses, the muscular coat by its elasticity adapts the Stomach to the quantity of food, it keeps the orifices closed, until food is digested and by its peristaltic action causes it to be chymified and propelled into the intestines.

The Mucous or internal coat presents two very marked appearances. That part lining the left termed the cuticular is but a continuation of

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the lining membrane of the Œsophagus. It is of great whiteness and is arranged in Rugœ or folds. The other portion lining the right side, is termed the Villous and covers a little more than half the internal surface of this Organ. It is soft, dark in color, and very vascular. It is on this side that the secretion of the gastric juice is effected and in this Villous portion are to be seen several apertures which are the openings both of the glands secreting this fluid and also of the mucous glands. Therefore, although it has been necessary to give a short outline of the different structures entering into the formation of the Stomach, still it will be seen, that it is with this latter portion that we are most interested, as secreting that fluid which causes such marked changes in the food. Let us now enquire how this fluid is secreted, what effect it has on the food and how this is effected. When the stomach is empty no gastric juice is secreted but immediately that food is introduced, it is poured rapidly into this organ and mixes with the various substances. Salt and other condiments increase its flow. The effect of cold water is first to lessen and then to augment its secretion, should however it be taken in large quantities digestion is retarded owing to a diminished quantity of gastric juice. It is a clear, transparent fluid of a decidedly acid taste, the active principles contained in it are pepsine and an acid which according to some authorities is Hydrochloric and according to others lactic acid. It is through the medium of both of these combined, that the changes, as will be shortly shewn to take place, are effected.

The general effect of digestion in the Stomach is, the conversion of the Food into chyme, which is a thick pultaceous fluid. The readiness with which food is acted upon by gastric juices varies according to the state of division of the various substances, hence therefore it will be seen how important it is that mastication should be properly performed. By minute division, the gastric juice more readily mixes with the food and the surface over which it can act is increased. Hardness of digestion must not be confounded with innutritive properties, for although an article may be difficult of digestion and may require a longer period to gain this end than most other substances, still it may be ultimately prove most nutritious. Many circumstances besides the nature of the food are apt to influence the process of digestion for example:

1*st.* The quantity of food—the stomach should be fairly filled but never distended.

2*nd.* Amount of exercise taken—a fair amount being favorable to digestion.

3*rd.* Tranquility during the hours of feeding.

4*th.* Constitution or bodily health and

5*th.* The state of the weather.

Allusion is now simply made to these but they will have to be again referred to when speaking about food and climate.

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We must now pass on to notice the part which the intestines play in the process of digestion and shall further have to consider the liver and pancreas, the secretions of which glands so materially assist in preparing the food to be assimilated. For convenience of description the intestines are described as small and large. The former being termed the Duodenum, Jejunum and Fleum, the latter the Cœcum, Colon and Rectum. Like the Stomach these are composed of three coats, as however the serous does not play any particular part in the function of digestion, it will be sufficient to notice any peculiarities which the muscular and mucous may present. The muscular coat is composed of two orders of fibres, longitudinal and circular, to enable the intestines either to contract lengthways or to diminish their calibre and thereby to regulate the passage of the food. In the horse we find the mucous coat arranged in folds which however disappear on distention except those situated at the first part of the duodenum which resist the effects of the traction; let us for a moment consider the use of these folds, they may be described as serving three purposes.

1*st.* They increase materially the surface for secretion of mucus, also for the absorption of those portions of the food which are fit to be assimilated.

2*nd.* They prevent too rapid a passage of food.

3*rd.* By interfering with the passage of food they cause it to be more thoroughly mixed.

It will therefore be seen how wisely again nature has arranged these structures at the commencement of the Duodenum, so that they cannot disappear when the intestine is distended, for it is at this part, as will hereafter be shewn that the important secretions of the liver and pancreas are poured into the digestive canal. The glands are very numerous and their apertures can be detected on the surface of the mucous membrane but as the part they play in the process of digestion is undetermined, we shall at once proceed to notice the important structures named Villi which may be said to entirely belong to the small intestines although a few are to be found in the Cœcum. It is to the presence of these that the mucous membrane owes its velvety appearance. The function of these small eminences is the absorption of those portions of the food which are completly digested.

Having described the structures entering into the formation of the small intestines, little will have to be said with reference to the large. They are made up in a very similar manner except that the villi are almost entirely absent and the glands are less in number. The function of the Cœcum would appear to be that of acting as a water reservoir. The large quantity of water taken by the horse could not possibly be accomodated in the Stomach and cannot be absorbed in passing over the villi in the small intestines, it therefore passes into the Cœcum where meeting with a large quantity of alimentary mass, it dissolves

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the soluble and assimilable matters and thus favors the absorption which is effected in the Colon. The portion, which cannot be absorbed consisting of indigestible and effete matter on arrival in the small part of the Colon obtains the name of fœcés and having passed through the rectum is then evacuated. In conclusion of this outline of the digestive tract, we must glance at the liver and pancreas, and point out the action of the fluids secreted by them.

The liver is an extremely vascular organ receiving blood from the Portal Vein and Hepatic Artery. The former bringing blood from the Spleen and Mesentery enters the liver, and from it bile is secreted and in it other changes occur in the blood. The latter, which in comparison to the size of the gland, is of small dimensions serves for the nourishment of the various parts of the liver.

The functions of this organ will call for our special attention as by this secretion, digestion is either hastened or retarded. The most important is the secretion of Bile but other changes are affected in the blood passing through the liver, whereby it is better enabled hereafter to serve its various purposes.

Bile is secreted in the numerous lobules to be found in the liver each of which is supplied with a small duct, these uniting to form at last the main large Hepatic duct, which terminates together with the Pancreatic duct in the duodenum about 6 inches from the Stomach. The secretion appears to be constantly going on but it is retarded during fasting and acelerated on taking food. It is a viscid fluid of yellow or greenish color, very bitter in taste. It has a neutral or slightly alkaline reaction and consists of $\left.\begin{matrix}\text{Water } 859{\cdot}2. \\ \text{Solids } 140{\cdot}8.\end{matrix}\right\}$ of the latter of which, the acids and coloring matters form by far the largest part. In cases of obstruction of the duct this coloring matter is frequently reabsorbed, giving to the skin and visible mucous membranes that peculiar yellow tint as is seen in Jaundice. The duties of the liver seem to be excrementitious as well as digestive. In the fœtus, when both the liver and lungs are inactive, the liver acts as a purifier of the Blood and the Meconium or thick fluid which is first discharged from the intestines after birth is proved to be bile in conjunction with other intestinal secretions. If therefore Bile is an excrementitious substance in the fœtus, it is natural to suppose that this end is also served in the adult. But in the latter it is not a direct process for few of the Bile products are to be found in the fœces; the theory of the method in which these products, no longer required to play a part in animal economy, are disposed of is as follows. It is thought that consisting as they do of much Carbon and Hydrogen, they meet with Oxygen in the lungs and are then passed off during respiration in the form of Carbonic Acid and watery vapour thus serving another important function viz:--that of generating heat, which is not required in the fœtus and this latter reason may account for the different means with which nature has dis-

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posed of these Biliary products in intra and extra-uterine life. We have however somewhat digressed to consider an interesting physiological property of Bile and must now study its digestive properties with which we are now more directly concerned.

The functions of Bile thus considered are:

1*st.* It emulsifies the fatty portions of the food and thus renders them capable of absorption.

2*nd.* It possesses together with the gastric fluid a strong antiseptic power, which may prevent the decomposition of food whilst in the intestines.

3*rd.* It acts as a natural purgative by increasing the secretion of the Intestinal glands and by stimulating the coats to expel the fœces.

This latter property can at once be proved by the constipation which is noticeable in Jaundice and by the diarrhæa which is always present when Bile is secreted in large quantities.

The liver in addition to its function of secreting Bile which is both digestive and excrementitious, and as possessing the latter property capable of generating animal heat, also has the power of forming sugar from the blood even should the food contain none of this substance. This latter conveyed through tne circulation also tends to sustain animal heat by the process of combustion.

It now only remains for us to consider the effect of the Pancreatic Juice and then to ask why these changes are effected in the food and how the ultimate products are disposed of.

The Pancreas in composition very closely resembles the Salivary Glands, its secretion is alkaline and contains a peculiar active principle named Pancreatin. Its functions are purely chemical whereby:

1*st.* It emulsifies fatty substances.

2*nd.* It dissolves Albumen

3*rd.* It probably converts starch into dextrine and grape sugar like the Salivary Secretion.

I have now attempted to shew the action of the various secretions of the digestive apparatus on food and it now only remains to point out what becomes of the ultimate products. To be capable of absorption or to be capable of assimilation, the various elements of food must be soluble, be it either before or after being partaken of, many substances which are thoroughly insoluble before, become so when exposed to the action of the Gastric Juice. Such are the nitrogenous principles, whilst others such as fats have still to proceed further to be subjected

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to the influence of the Biliary and Pancreatic fluids. When in a state of solution these are absorbed directly through the lacteals which pour their contents into the blood, thus supplying it with the necessary elements for building up or repairing the waste which is constantly occuring in the animal frame.

We have now sufficiently investigated the anatomical peculiarities and enquired into the physiological properties of the various parts of the digestive tract to enable us hereafter to understand the causes which will be shewn either to hasten or to retard the process of digestion. I must however ask my readers not to look upon this as a description of the organs concerned but rather as an outline, in which the most important points have been attempted to be set forth, with the intention of being better able to demonstrate the results which may arise from any interference with their normal functions.

We shall now proceed to enquire into the various causes which are instrumental in bringing about these results.

To commence with Water, we shall have to remark on, 1*st*. The quantity required. 2*nd*. It quality and mode of detecting impurities. 3*rd*. The means which we possess of purifying it, 4*th* and lastly it will be our duty to point out the effect caused either by an insufficient or an impure supply.

The supply of water for horses is one that constantly demands our attention, for entering so largely as it does into the composition of the animal body it is one of the great means by which disease is induced and to guard against this occurrence we must ensure a sufficient and regular allowance to each individual horse. How then is this end to be gained? I know of no better method than that of keeping water constantly before them. This enables them to drink when they are thirsty and avoids the evil consequences of allowing them to gorge themselves at any particular time. I have already pointed out when speaking of the best method of watering horses, that the great evil in leading horses to a trough is that the Syce, impatient to return to his stable, draws the horse away before he has had sufficient, the result being that the next time he is watered he will so gorge himself, that some type of abdominal disease will surely follow, it may be but a simple case of Colic but as will hereafter be seen the consequences of this are sometimes fatal; by allowing water however to remain constantly before them, this cannot happen. To carry this out either a large Chatti placed in mud mortar or an iron bucket seem to be the best vessels for containing it. If Chatties are used they must be fixtures as unless surrounded by mud mortar they are constantly broken. They are therefore open to the two following objections.

1*st*. That 2 are necessary, one for the inner and one for the outer standings.

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2nd. That by being immovable they are not so easily cleaned.

I therefore prefer the use of the iron bucket which can be placed in whatever situation it is thought fit to picket a horse. Care must be exercised that a constant supply of water is given and that whatever vessels may be chosen that they are daily cleansed. This system will be found invaluable during the hot weather and I have it on good authority from various stations in this presidency that horses so treated not only look better but that the percentage of cases of abdominal disease is much lessened thereby. A horse will consume on an average 7 gallons a day, but the amount will vary considerably according to the state in which food is given, to the temperature and to the amount of exercise allowed. I have found that horses fed on soaked unbroken gram, which naturally contains a large quantity of water, do not drink as largely as horses fed on crushed, only slightly sprinkled with water. A high temperature has such a well known effect in producing thirst that it is needless to make any further comments on the subject whilst from the foregoing remarks on exercise it will be seen that, during the exercise, the watery vapour exhaled by the lungs or secreted by the sudoriparous glands must be counterbalanced by the imbibition of a large quantity of water. It used to be a theory that horses whilst on the march should not be supplied with water, and that when arrived at their destination none should be given until they were cool. I am however thankful to say that, this at one time widely spread notion, is fast dying out and from experience I can state that horses which, on my recommendation, have been frequently watered whilst marching, have invariably kept their condition, have been less liable to disease than those to which water has been sparingly given. The Body must have water, and the best means to supply its want is to give it frequently and in small quantities. Of course let it not be understood that I am advocating the plan of allowing an unlimited supply when hot but if frequently supplied a horse will not take too much at any time and I cannot call to mind a single instance in which any ill effects have been produced by the adoption of of this system. A small quantity will frequently revive an exhausted horse and enable him to continue his work. Water should always be given some time before feeding—an hour if possible. The reason of this will be apparent when we refer to the foregoing outline of the anatomical and physiological features of the digestive tract. It will there be seen that the greatest absorption of the Nutritive elements of food takes place in the smallintestines and stomach, if therefore, as has been shewn water does not remain in this latter organ but passes at once through it to the Cœcum, it can be inferred that, if given after instead of before feeding, it must naturally take with it a large quantity of material which has not yet been absorbed, and this will be removed with the fœces and the animal deprived of a great amount of nourishment; in addition to this another evil result is likely to follow, the food thus removed from the stomach not having been subjected for a sufficient time to the action of the gastric juice, is passed into the large intestines in an undigested from and is then very likely to cause intestinal irritation.

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Having now pointed out the importance of a constant supply of water let us now direct our attention to its quality, for in this, we shall find, lies a frequent cause of interference with the digestive organs, not only however are these organs affected by its quality, but it will also be shewn that diseases which at times assume an epizootic form are attributable on some occasions to an impure supply. "The time is at hand "says Müller, when the causes of disease shall not only be sought for in "the air, in our method of living but in the incautious use of waters "often abounding with innumerable animalcules."

Water is rendered impure by a number of substances such as salts, gases, metals and organic matters, but it will be sufficient to allude to the differences existing between hard and soft and to the various sources from which animal and vegetable matters are derived. First let us glance at the leading features which should guide us in our selection of water for drinking purposes. It should be transparent, clear and devoid of smell or taste, any water if turbid must be looked upon as suspicious and if there is either smell or taste it should be subjected to careful analysis. It must not be however thought that because water is pure to the sight or free from taste or leaves no unfavorable impression when smelt, I say, it must not be naturally considered pure and I would always recommend a thorough examination when any disease shews itself in a district as an epizootic.

Water which only contains a small amount of saline matter in solution or when this consists mainly of alkaline (Potash and Soda) salts, is called soft, whilst water holding in solution salts of lime, magnesia or Iron is called Hard. This so called hardness being chiefly due to the Carbonates, Sulphates and Chlorides of Calcium, and Magnesium. The Carbonates are held in solution by Carbonic Acid gas, by boiling, this latter is driven off and they are precipitated. By the removal of Carbonates in this way, the remaining water is rendered softer but it may according to the original composition still retain an amount of permanent hardness which is due to the Sulphates and Chlorides not being precipitated. The greater the permanent hardness, the worse is the water for horses. The simplest and still effectual method of discriminating whether water is hard or soft is that of dissolving soap. Hard water will cause it to curdle, whilst soft water will induce it to lather.

In our examination to detect organic impurities we must be careful to collect the water both at its source and at the place from which it is drawn, for during its transit it may become greatly impregnated by both decayed animal and vegetable matters. Open conduits are always objectionable, as they render the water liable to be thus contaminated; most of the chemical tests necessary for the discovery of these impurities are most complex and would I feel far exceed the object of the present paper; as however we have seen "Condy's" fluid test to be useful in ascertaining the amount of organic impurities in the air of stables, so will it assist us in forming a rough idea of the

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amount of them in water. The test is performed in the following manner. Take half a pint of the water, previously acidified by about 12 drops of sulphuric Acid, add Condy's fluid drop by drop until a faint pink tinge is perceptible. Every 15 minutes examine the water, and as the color disappears, add a few more drops of the fluid and this to be continued until the color remains permanent for half an hour. All organic matter is then destroyed and the quantity of fluid required to effect this gives a rough estimate of the organic matter originally in the water. The microscope will also greatly assist us in deciding whether the water is potable or not. In thus prosecuting our investigations we shall discover worms and their ova. Bacteria will also be seen, these are always found in the blood of animals suffering from anthracoid diseases and therefore it has been surmised that water is one of the causes in operation to induce that most fatal disease known as "Malignant Fever," as however it has been shewn by Parkes and other authors that these rod like bodies are to be found in the purest distilled water, it is only natural to suppose that they are not hurtful in themselves, at the sametime however water containing large quantities of them would indicate the existence of organic substance in a state of putrefaction, it should therefore be looked upon with suspicion and a careful examination should be made.

When water is proved to be injurious to health either by its hardness or by containing a large amount of organic matter, the best method to adopt is to endeavour, if possible, to obtain it from a different source, or by enquiring into the cause of its impregnation with either vegetable or animal matters, we may be able to remove it entirely. It was shewn for example when speaking of manure pits that it was necessary to prevent their being placed in the vicinity of wells, should this be the cause removal of it may be followed with beneficial results. Filtration is naturally the best method of purifying water and as this when required on a large scale is one which would require a great amount of space and would lead one into the discussion of subjects which are more in the province of the Engineer, I shal content myself by simply mentioning it.

Enough has now been said to enable us to detect the more common impurities of water, we must now proceed to enquire into the effects produced by water on the digestive tract and at the same time shall cursorily pass in review, its indirect influences on different parts of the body. It has already been pointed out that the effects of large draughts of water are injurious and are instrumental in bringing about cases of Colic, an insufficient supply on the other hand is equally injurious, horses subjected to this latter mode of treatment will shew a great loss of muscular strength and be unable to undergo much exertion, the necessity therefore of a free supply is indicated and let this be the Maxim of every horse owner in India "Frequent and small quantities," large quantities have been shewn to arrest the secretion of the Gastric Juice and when this results, digestion must be imperfectly performed.

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As is natural to suppose, the parts of the body most likely to become affected by impurities in water are those with which it first comes in contact. These being the lining membranes of the different organs of digestion, they are most likely to be functionally deranged. Hard water is known to produce constipation, and Colic with its consequences follow, it is also a well established fact that horses removed from a district where soft water abounds to one where hard water alone is obtainable, suffer greatly from abdominal affections and in many cases we notice a staring coat and general unhealthy appearance. Custom however seems to partly remove the effects. Salts of lime have a tendency to lessen the secretions and this must be looked upon as a great cause of indigestion in the horse. Conversely we find that Diarrhœa is caused by water containing an undue proportion of vegetable or animal matter. In all cases therefore where Diarrhœa makes its appearance as an enzootic, water should at once be suspected, numerous outbreaks in the human subject have been traced to this source and have terminated on the water being changed. If therefore both Constipation and Diarrhœa can thus be traced to the use of impure water, it will be seen that they, as being only indicators of some pathological change in the digestive tract, point to the fact that water plays a very important part in the process of digestion.

The Etiology of many specific diseases also proves that water exercises some influence in their production, Malarious and Typhoid Fevers in the human subject, have been satisfactorily traced in many instances to water and likewise in the lower animals water obtained from Stagnant Pools or marshes is a prolific cause of diseases due to an altered condition of the Blood, the study however of this is one that would cause us to digress too much from our object. The mere mention of it will suffice to shew, how necessary it is to give water of pure quality. Let me whilst speaking of specific diseases in connection with water point out that the virus of glanders is frequently communicated through the medium of water, and therefore I would impress the fact forcibly that horses effected with the slightest nasal discharge should never be watered at a trough.

Entozoa as frequenting the intestinal canal must also be alluded to. The Ascarides lumbicoides enter the body by drinking water. The Strongylus also appears to be admitted in the same manner.

A large proportion of earthy salts in water has been known to cause concretions in the intestinal canal whereby the passage of food is obstructed, in a like manner the presence of these, especially Calcium Carbonates and Sulphates, give rise to exostoses in young horses.

Diseases of the skin, in the human subject, have been also frequently traced to impure water, especially the various epidemic forms of Boils and Ulcers and from the "Annual Report of the Sanitary Commission with the Government of India 1867" it would appear that the so called

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Delhi Boil has much decreased in frequency, since the use of impure well water was discontinued. As bearing strong analogy to the ulcers described as affecting the human subject in the East, such as the ulcers so common in the north west and Frontier, I would ask cannot these phagadenic ulcers so frequently seen on the lips, sheaths &c., of horses, be in some measure attributable to water?

I shall only allude to another form of disease to which water is supposed to give rise viz: Bronchocele or hypertrophy of the Thyroideal gland, it has been proved to be caused by water in the human subject and has also been traced to this source amongst horses on the Continent.

In conclusion let me add that leeches very frequently, especially in the hill stations, are to be found in the water, they give rise at times to serious hœmorrhage from the nostrils, and are best removed by keeping the horse from water for 24 hours, when then it is given they descend and should be seized with a pair of forceps.

I have now concluded the subject of water and have found it necessary to digress somewhat from the subject of this paper but although some of the effects of either a deficient or an impure supply may not be directly due to indigestion still they may certainly be looked upon as indirect causes when we consider that the peculiar properties by which they are brought about must first enter the digestive Canal and be absorbed and thereby must necessarily interfere in a measure with the true process of digestion.

It will next become our duty to enter into the question of food, on this subject as forming one of the chief causes of indigestion it will be necessary to speak at some length. First we shall have to consider what is food, and what part does it serve in the animal economy, what are its leading chemical and physiological features, pointing out, at the same time, the best means of detecting impurities: then it will be further necessary to consider food in connection with work, the best methods of feeding and in conclusion I shall attempt to shew the diseases incidental to food either by its being deficient in quantity or quality or on the contrary by an excess of these properties or by a wrong system of feeding being adopted.

Food is that substance which having been subjected to the various juices in the elimentary tract and having become fit to be assimilated, goes to build up or to repair the various tissues of the animal frame. In addition to this most important function, it is the great heat producer or fuel whereby the temperature of the body is maintained, its effects on health are always most marked and as is the case with water it is only natural that the organs which are most likely to be effected by it are those with which it first comes in contact and those which are employed in elaborating it and making it fit for assimilation, these being the stomach and intestines it will be seen

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how important the study of this subject must be in considering the causes of indigestion. Chemistry informs us that the various solid tissues of the body are composed of Nitrogenous, fatty and saline matters, if therefore food is requisite for repairing loss sustained by these substances, or as in the case of growing animals is required to build them up, it is primarily necessary to acquaint ourselves with the fact whether the food we give contains the elements necessary for the proper performance of these functions. Milk which is the exclusive source of nourishment to the young of mammalia and one of nature's own products, seems to be fitted in every way for the maintenance of the general well-being of an animal. Let us therefore for a moment glance at its composition and then ask ourselves how it is capable of restoring the various tissues. It contains Water, Casein, Butter, Sugar and Salts. How wonderfully has nature arranged for the supply of the various elements. The Nitrogenous alimentary portion of Milk is represented by Casein, the fatty by Butter, whilst amongst the Salts is phosphate of lime, one which is absent from no tissue, but especially is it required for the formation of bone. Again it was stated at the opening of this subject that one of the functions of food was to produce animal heat, and nature has also provided this in milk in the form of sugar. If therefore it is necessary that food should contain these proximate elements, it must be our duty in the selection of food to assure ourselves that they are comprised therein. Omnivora, Carnivora, and Herbivora, are nourished precisely in the same way, for it is a notable fact that the various kinds of food, be they animal or vegetable, are very similar in composition, and are each capable of maintaining the body in health. We know for example, that a man, who is an omnivorous creature, is able to sustain the body on vegetable substances alone. The vegetarian is frequently most healthy, but whether he is able to undergo the same exertion as if he partook of animal food is a question on which some doubts have arisen.

Let us for a moment assure ourselves of the identity of animal and vegetable foods and their ability to sustain the various tissues of the body. The following table will assist us.

Animal Food.	*Vegetable Food*
Water.	Water.
Nitrogenous matters.	Nitrogenous matters.
Fibrine (flesh).	Gluten (oats &c.)
Casein (milk).	Legumen (peas, beans &.)
Albumen (eggs).	
Fatty matters.	Fatty matters.
	Starch-gum and Sugar.
Saline matters.	Saline matters.

In the Nitrogenous matters the gluten and legumen supply the Herbivora with flesh forming materials, just as is supplied to the Omnivora by Casein, Fibrine, or Albumen. The formation of fat in Herbivora

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is more complex than in Omnivora, for in the latter it is derived in a direct way, whilst the Starch and Gum as taken by Herbivora have first to be converted into Sugar, it will therefore be seen that the organs which are capable of effecting this change are of great consequence in the horse, and as has already been shewn, the Saliva accomplishes this to a greater extent, although undoubtedly the liver materially assists. In selecting a food, we are guided greatly by the work which is expected of an animal, for example if we require a horse for very hard work, in which there is great waste caused by muscular action, we must necessarily give him some article of food which contains a large amount of flesh forming materials. The following table compiled from a small work on "food and work" by "Hunting" will serve as a mode of ready reference, should we be in doubt as to the nature of any particular kind of food.

Composition of various articles of Food.

Article.	Water.	Woody Fibre	Starch-gum and fats	Nitrogenous matters.	Ash or Salines.
Beans and Peas	14·5	10·0	46·	26·	3·5.
Barley	13·2	13·7	56·8	13·	3·3
Oats	11·8	20·8	52·	12·5	3·
Maize	13·5.	5·	67·8	12·29	1·24.
Hay	14·0	34·	43·	5·	5·
Carrots	85·7	3·	9·	1·5	0·8
Gram	13·39	7·6	62·18	12·77	2·60.

From the above list it will be at once gleaned that whilst some foods are of great value as flesh formers others on the contrary tend more to the formation of fat; a feeding grain should possess as little Woody Fibre as possible, for it must be remembered that this is thoroughly indigestible. We must therefore be entirely guided by the work required and also by the climate, for it has been before remarked that the fatty matters are supplied as fuel to the body for the maintenance of its temperature, it will therefore be at once seen that the supply is not so much indicated in a hot climate as in a cold one, and, *vice versâ* that more is required in the latter—take for example the Esquimaux, whose natural climes are of the coldest, their staple food is oil, because, without a large supply of this article, animal heat could not be sustained.

Other qualities of food have however to guide us in our selection; for example, we must watch their ordinary effects, for a food which may serve one purpose by being a good flesh forming article may have a constipating effect, this we know is the case with beans and peas, on the contrary Bran, Maize and other substances have a laxative tendency;

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therefore by a carefully regulated diet we are able to guard against these various properties.

In enquiring whether a food is of value or not, we must first become acquainted with the fact whether it is of a digestible nature or not: Digestibility depends greatly on the original nature of the substance, but it also partly depends on the method in which it is prepared prior to its being given. When speaking of the action of the gastric juice it was pointed out that minuteness of division was necessary for the proper action of this secretion, mastication will therefore also have a great influence on the digestibility or non-digestibility of an article of food. The admixture of different kinds of food greatly aids digestion; it will from this be gathered that an admixture of bran with grain, especially if of a constipating tendency, will be beneficial: the admixture of grass also with grain is of value in causing mastication and consequently ensuring a greater flow of saliva. The amount of food taken at one time will, according to its greater or lesser quantity either hasten or retard digestion. To ensure the proper digestion of food, every portion of the body engaged in the process must be in health, and the various secretions must be of proper composition. This will depend on a variety of causes such as nervous excitement and proper circulation of the blood, &c., all of which we shall have to allude to when speaking on the subject of disease.

Having now made a few remarks which will be sufficient to guide us in the selection of any particular food, let us now direct our attention to their individual qualities and as affecting us mainly in India we shall more particularly have to consider Gram, Barley, Maize, Oats, Bran and green forage in general.

GRAM. One of the most commonly used grains in India, will be seen by reference to the foregoing table to be rich in fatty and nitrogenous matters and therefore may be considered a very good feeding grain. As, however, digestibility is a matter which has also to be taken into consideration, we must ask ourselves, is it easily digested or not? To this I would reply in the negative, if it be given, as it most usually is, after being split and sprinkled with water. When the digestive organs are in full vigour, it is most likely that it can be assimilated, but when impaired either by disease or by climate, which takes place during the hot weather, I have frequently proved that a great portion is not thus assimilated, but that it is voided with the fœces. I have lately experimented with this article of food by administering it after it has been soaked and allowed to germinate and have then found it to be more easily digested and as such would recommend its use in this form. I shall however defer any further remarks on this portion of the subject until I am treating on the method of feeding.

The best means of detecting impurities in Gram, is, first to take a sample in the hand and to carefully inspect it. Its size must first be

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considered, for let it be remembered that the smaller it is, the more woody fibre does it possess and as this is thoroughly indigestible, its value as an article of food diminishes in ratio to its size. We are then enabled to see whether it is affected with weevils or not; these small creatures burrow through the outer coverings of grain and feed on the nutritive parts. Therefore should a sample be thus affected to any extent, we can at once understand that gram would not only become innutritive, but by containing a quantity of indigestible matter, would cause derangement of the intestinal canal by irritating its internal or *mucous* lining. Should a sample contain a number of light colored grains, we can at once assert that it is of mixed quality; these are immatured grains and are of no value: when tested they are of great hardness and innutritive. Having thus far ascertained whether the gram is good, fair or indifferent as far as we can judge by ocular observation, let us further investigate it by soaking, which will reveal its impurities to a greater extent. To do this we take a known quantity of grain and into some vessel containing water, we pour the gram very slowly; by this means nearly all the weeviled grains will be at once separated from the others and will float on the surface. By carefully removing these and then drying them, we are then enabled to state what percentage is thus affected. Let the gram then soak for about 6 hours—any seeds which are black and of no value will be found resting on the upper surface, and, in addition to this, we shall more plainly see that the light colored grains before mentioned, have in no way been affected, but that they are as hard as before they were soaked. By again carefully removing all these seeds and weighing them when dry, we can ascertain the percentage and thus form our opinion of the gram in question. Any grain which has not germinated during this period will be valueless as a feeding article but not only will it be innutritive but also will it be injurious by causing derangement of the digestive organs. It will therefore be apparent how careful we should be in the selection of the grains as in this lies one of the main causes of abdominal disease in the horse.

In Barley we have an excellent grain if a change of food is required—this is sometimes imperative owing to the prevalence of outbreaks of abdominal disease. These outbreaks at times assume an enzootic type, the cause or causes of which, although carefully investigated, cannot be discovered. Change of diet frequently exercises a most beneficial influence on these occasions and, when thus required, Barley supplies us with a ready means of affecting it. As in the selection of any other class of food we must first assure ourselves that it is of good quality. Let us therefore note its peculiar features and then see what its main impurities are. It is rich in fatty and nitrogenous matters, but has a somewhat laxative tendency, which is no doubt induced by the irritation of the lining membrane, by the sharp husks. This can be counterbalanced by giving it in the proportion of ½ gram and ½ Barley slightly lessening the quantity of Bran, and I have found that horses fed in this manner thrive very well. The grains should be well filled, not discolored, and should possess no musty smell. Barley, though less liable than gram, to the

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ravages of the weevil, is still at times attacked by it, but the main source of disease, and one to which objection in this country to Barley is mainly due, is, that it is very frequently affected with fungi which are owing to a species of Uredo; if present in large quantities, they are visible at the root of the hair, with the naked eye, if but in small numbers, however, they are only microscopic. This is more frequently a cause of impurity in this country than in others owing to the peculiar method employed by natives in storing their Barley, viz: that of placing it under ground whereby it becomes heated and fungi are produced. I have, however, found no ill effects arise even when Barley so affected is parched and bruised and given in the form known as *Ardawa*. If it should be selected as a feeding grain, the process of parching and bruising should be carried out under supervision, as *Ardawa* is frequently much adulterated. The most common ill effect arising from the use of Barley is that of diarrhœa but as this can scarcely be looked upon as a disease but more properly must be considered as only a symptom of some derangement of the alimentary Canal, care must be taken to enquire into its cause and if it can be traced to Barley either through being given unparched, or through its being largely affected with fungi, the discontinuance of it would be clearly indicated. On several occasions, I may add, I have seen evil results arising from Barley being given in a raw state. In the cases to which I allude, it seems not to have been in any way acted upon by the gastric juice. In these cases irritation is caused to the coats of the Intestines and serious, even fatal, consequences ensue.

We next come to the consideration of Maize as a feeding article, and I fear that this is one of the grains to which sufficient attention has not yet been paid in India. In England, for many years, public opinion was strongly prejudiced against it; by degrees opinions became divided and lastly it is now almost universally owned to be an article of food, on which a horse thrives well and on which he is able to undergo great exertion. So in this country it has been tried and in some instances has been decided against, but I feel certain that if the effects were carefully watched, it would be owned to be a good grain, and as adding another to our restricted number of changes of food, would prove of great value to us. By referring to the table above, it possesses but 5% of woody fibre, this amount must however be a little increased as the analysis is one of American Maize, which is larger in the grain than that usually grown in this country. One peculiarity possessed by maize is, that it possesses some laxative property, which, however unlike Barley, does not seem to be caused by its irritating influence on the Bowels; this therefore would be beneficial in the hot weather when cases of severe Colic due to constipation are prevalent. Of course I would not urge the use of Maize alone, but as I have before maintained that mixed food is most beneficial to horses, so I would recommend its use in connection with gram or some other grain. Barley should however be avoided as it also possesses a laxative tendency.

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I would have passed over the mention of Oats as a feeding article in this country, had I not been assured on good authority that they prove of value in those cases of obstinate skin disease which affect our horses during the summer months. They certainly are good feeding when procurable of good quality, but as it will be seen that they possess more woody fibre than any other grain, it is evident that unless the sample is that of a heavy full oat, it should be rejected, as the proportion of indigestible material in a thin oat is too large for nutritive purposes and is sure to derange the digestive organs. I last year obtained some samples of up country grown oats; they were, however, for the most part of too inferior quality to enable me to carry out the experiments which I had intended.

I next pass on to consider the effects of Bran on the intestinal canal, and on nutrition in general. It is the result of the process of decorticating Wheat and Barley and would appear to be rich in nitrogenous matter; as, however, before stated, the chemical analysis of a food alone is not sufficient to stamp it as a good article of food, and Bran exemplifies this, for, although rich in Nitrogenous matter, still a portion of it is not in a digestible form and is therefore voided with the fœces. We have however in Bran one of the most useful of laxatives and correctives to other grains of a constipating tendency, and in this country especially where constipation is a frequent cause of abdominal disease its use is most clearly indicated, and, unless a horse is undergoing some violent exercise, such as that of training, I would recommend the constant admixture of this article with the other grains. Great care has to be taken in the inspection of Bran as, in this country, it is most largely adulterated. In one sample tendered for issue as much as 33% was found to consist of sand which naturally must prove most injurious. This is easily detected however in the bulk, by its weight—other impurities such as sawdust are occasionally to be found.

Hay will next absorb our attention for a short time, and I may say that I look upon a good supply of this article as one, whereby we have in our power, the means of reducing the number of cases of abdominal diseases to a great extent during the winter months and monsoon season, when the only grass obtainable is of such a succulent nature as scarcely to be fit for food. If a good rick is at hand, we are then enabled to regulate the allowance of this pernicious article and to replace it by good sweet hay. If not however, we are compelled to give this grass, for horses cannot exist on grain alone but must have, besides, some bulky material in order to distend the stomach to a certain extent and thereby increase the powers of digestion. The results of giving grass of this nature will invariably be a vast increase in the percentage of cases of abdominal disease and also in mortality arising therefrom. The question of grass is one which is pressing itself daily more and more on the consideration of Government. We shall hereafter have to speak again on this subject, but as affecting the hay crop let me state it is my opinion that to every station should be attached at least such an amount of land that would

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ensure a good supply of this fodder. Once the lands are obtained let them be sown with the most nutritive grasses, let them be properly cared for and manured and we shall then have one of the greatest safe guards against abdominal disease. We must now glance at the leading characters of good hay and see how they are best ensured. Hay should be clean, firm, crisp, sweet smelling and green, it should be cut as soon as it is ripe. Hay which has gone to seed has lost a great quantity of its nutritive properties. It should not be stacked when wet or too green, but on the other hand the plan of drying hay to too great an extent is one that deprives it of its good qualities. A certain quantity of Salt mixed with the Hay when the rick is made, will add greatly to it, by making it more palatable.

We now arrive at the consideration of grass, a question which demands of every body the utmost thought, for, as before remarked, can anything be worse than to be obliged to give food of such quality as we frequently are compelled to do during the wet weather. It then consists of quickly grown succulent grass which causes diarrhœa and ultimately other abdominal complications of the most severe type. In addition to this we sometimes can obtain nothing but the coarsest roots of grass, as was the case during the drought of last summer and the following months. On these occasions, take a portion and compress it in the hand, and you will be at once made aware of its sharp hard ends, in many cases which I have on record, death has been caused by these peircing the coats of the stomach. In addition to this, diarrhœa and severe cases of Colic ensue. But not only are cases of Colic and other enteric affections prevalent during these periods, but the whole of the horses suffer materially in other ways, the loss of condition amongst the various mounted corps (especially the walers and bigger Stud Breds,) last year at some stations was incredible. What means then have we of remedying these evils? The first and most important is hay, with this article at hand we can at once counteract the injurious effects. If, however, it is not forthcoming I would strongly recommend that five seers of "Kutte" by which I mean oat sheaves cut into chaff or in districts where oats are not grown five seers of good Bhoosa, be daily given to each horse. When grass is quickly grown as in the rains, it possesses a great amount of water, let us then give food of a non-laxative nature and I think we can select nothing better than the mixture before alluded to viz: Gram and Ardawa, avoiding lucerne and other green foods. If on the contrary the grass consists only of hard dry roots, let us endeavour to obviate its disastrous results by chopping it prior to its being given. In no portion of food for horses in India is supervision more called for than in grass and where this is not exercised casualties are sure to occur. Grass cutters will adopt any plan that they think will succeed to bring in their proper quantity or to make up weight by wetting the grass, and, when it is scarce, will bring in various kinds of valueless weeds obtained from the bottom of Nullahs and elsewhere. Having therefore assured ourselves of the weight we should have every bundle opened, a glance will suffice to decide whether it is good or bad and we can then at once

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reject any that has either been wetted or that is not of fair quality. Attention of this description, will in a very short time ensure grass of the best obtainable character being brought in, but lessen the amount of supervision for a few days and evil results at once occur. During periods of scarcity when visiting the hospital, I have been told that three or four cases of Colic have been admitted. I at once suspect the grass and on examination in the majority of instances my suspicions are confirmed. We can then see of what importance the question of grass must be. I would add a few words on the process of cleansing. It is usually well beaten out by the grass cutters themselves, these men however having to go out again for the next day's supply are obliged to clean it before it has dried, if therefore we inspect it afterwards we still find a quantity of earth adhering to the roots, the effect of this is to materially interfere with disgestion. I have found it a good plan to see that every syce is supplied with a stick with which he should be made to thoroughly clean every feed before giving it to his horses. The grass should consist of *Dhub* and should amount to 20 seers per diem for each horse. One more cause of indigestion arising fram grass, to which I must allude, is that which is due to the plan of placing it, when brought in, in two or three large heaps; at this time, not being dry, it speedily ferments and turns yellow. I would therefore always recommend its being spread over a large surface.

In conclusion of this portion of the subject let me offer a few remarks with reference to Green forage, which in India is of such value to a horse, and as seeming to grow best in this country. Lucerne and or guinea-grass are most worthy of consideration. During the dry season when constipation is frequent it especially forms an excellent corrective but in fact at all times if we except the rains it is of great value. When first given to horses it should be in small quantities which can be gradually increased, it should be fresh, as decomposition soon sets in, but it should never be given whilst dew is still on it, nor when soaked with rain, as it then frequently causes obstinate diarrhœa and other intestinal derangement, let me however not be understood to mean that it should be dried as I have seen done, for if so, it loses to a great extent its beneficial laxative properties. Lucerne is certainly one of the most valuable of green foods but the objection to it, is the amount of water required in its cultivation. When therefore a supply sufficient for its, culture cannot be obtained we can easily grow guinea-grass, as this latter requires but little moisture. Two other foods must not be forgotten whilst speaking on this subject viz: Carrots, and Green Barley The former when obtainable of good quality, that is to say not woody, are very valuable. To obtain a fair equivalent in lieu of gram 4 Mds should be exchanged for every maund of gram. In green Barley we have a very ready means of giving horses green food during the spring, at a season when they are changing their coats. I would, however, caution against the use of this article when it is begining to come into ear, at this time it produces purgation and other intestinal complications of the most severe type and should then never be given.

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A few words on the subject of "Food and Work," with their relative proportions, may not be altogether foreign to the subject of this paper, for altho' they may not be looked upon directly as causes of indigestion still indirectly they must be considered as such, for if horses once fall below a certain standard, or, in other words, if the work is in excess of the food given, then they are by far more susceptible to other causes which induce the occurrence of abdominal diseases, than are horses which are in good tone. Food and work, therefore, should be always considered together, and can anything be more opposed to physiological arguments than the fact of horses receiving the same amount of food during the summer months when only an hour's exercise on an average is given, as they do during the winter season when their work is hard either on the drill ground or on the march. I have before attempted to shew that by exercise the muscular system is developed and that by food it is maintained, and the waste repaired. If, therefore, there is no waste, as much material for repair cannot possibly be required as when on the contrary the work is great and large loss of muscular tissue takes place, then it will be seen that more flesh forming material is required. I have frequently been told during the Autumn Manœuvres in England "The work is too great for our horses" My reply was always "No, but the food is too little." I may say that during my service I cannot call to mind a single instance when I could conscientiously assert that the work was too hard for any horse, provided of course that he was in fair condition, and I practically proved the value of an extra allowance of flesh forming material as contained in grain whilst in charge of the Artillery at the Dartmoor Camp. Here the work was severe, the hills were steep and the ground very heavy, and in addition to this, the cold and wet intense. On my recommendation 4 lbs. extra oats per horse per day were allowed and during the month but a small percentage were on the sick list, and on return to quarters it was universally owned that horses could not have looked better. Let us endeavour, therefore, to regulate the food according to the work required of our horses, and in doing this it will be found that the sum total of grain required during the year for each horse, will not exceed the amount now allowed; but by proportioning it with care in ratio to the work we will find that during the summer we shall have fewer horses on the sick list; whilst during the cold weather, by being enabled to give what has been saved, as an extra allowance, we shall be able to put our horses to hard work without their suffering thereby. Camps of Exercise and any other extraordinary occasions, if the work is excessive, will of course form exceptions to the rule, then a slight increase in the rations may be absolutely necessary. One more point to which I would draw attention is that the allowance for Walers is laid down at 5 seers, whilst that for all studbreds is but 4, granted that as a rule this will be found sufficient, but surely our larger stud-bred horses, some measuring 16 hands, require as great a quantity as many of our Walers. It may be replied that this is a question which can be regulated by the Commanding Officer. It certainly can in a measure be, but if regulated by him, he must rob the Walers to give to the Stud Breds and as I am of opinion that five seers

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is not too large a quantity for these latter animals when in hard work, they must suffer thereby and I would like to see the extra seer extended to our larger Stud-Breds.

We must now pass on to speak of the method of feeding. The first question into which we shall have to enter, is, whether it is more advantageous to feed horses from mangers or from the ground—by which system is digestion more rapid and by which is it impaired. My experience leads me to reply that as a rule mangers induce cases of choking and also derangement of intestinal organs. I have been frequently asked when recommending the system of feeding from off the ground, why in England, horses do not suffer from the use of Mangers. Let us for a moment glance at the Mangers in India and compare them with those at Home, and the reply to this question is then easily given. A manger in India, as a rule, consists of a mud pillar into which a narrow deep *gumlah* is inserted, whilst at Home they consist of long shallow troughs which enable the food to be spread over a large surface thereby preventing a horse from taking a large mouthful at one time and bolting it; but in addition I maintain that gram is a grain more difficult of digestion than oats; and therefore it is necessary that it should be fully subjected to the various secretions which assist in this process. When speaking on the salivary glands I was careful to describe the course taken by the various ducts; my reason for doing so was to show that the flow of this necessary fluid was increased when the head was in a pendulous position, digestion is thereby facilitated, and I maintain that it is our duty to aid it by every means in our power, in a country like India, where, owing to climatic influences, the digestive powers of the various parts are impaired. Cases of abdominal disease are as a rule of rarer occurrence and less severe in character when this method is adopted, and I have on record one particular outbreak of Colic, in which the mortality was very great, that was almost entirely arrested by the adoption of this system. Let it however not be understood that this is a panacea against the appearance of abdominal disease. So many causes are in operation that this must only be looked upon as one, and cannot possibly be expected to be a remedy for other results of mismanagement. When therefore Colic assumes an enzöotic form, other causes must be closely investigated. The objections raised to this system, are, that it is impossible to keep these mud troughs clean during the wet weather, but I affirm that they can by being carefully made, be so drained as to be serviceable even in the very wettest weather; still I would prefer earthen pans to be supplied, well understood however that they are in no way deeper or smaller than the dimensions laid down for the present Mud troughs. Finance however here steps in and objects on the ground of expense, and I must say that it is a debatable question in my mind whether any actual good would be derived from their adoption, still for appearance and cleanliness they would be an improvement. Cases of choking are much less frequent when horses are thus fed from the ground, and the reason can be readily understood. Horses standing in large bodies from fear of

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being robbed by their neighbours acquire the mode of feeding greedily and bolting their food. If, therefore, fed out of mangers which are deep and high they are enabled to take a large mouthful and swallow it without the slightest mastication if however fed from the ground and the food is spread over a large surface they cannot take much in their mouth at one time and the position of the head prevents bolting. Even a chronic case of choking in which dilation of the Œsophagus had taken place, was prevented from recurring by feeding the animal from the ground with the food spread over a large surface. If, therefore, as I have attempted to shew that the use of Mangers is injurious, how much more must be the use of Nose Bags which are at present issued. By their very formation they are unsuitable for feeding purposes and when in camp, I would strongly recommend the plan of feeding off blankets as a means of preventing choking and of counteracting the many other fatal effects of derangement of the abdominal viscera which so frequently occur on these occasions.

We next arrive at the form in which food should be given. I have already pointed out that I consider gram, when soaked whole, to be preferable to it when simply crushed and sprinkled with water. My experience plainly proves the fact, but it may be objected to on the grounds that it is that of only a few months duration as this system has only been lately tried as an experiment. I have however satisfied myself and received corroboration of my opinion from an Officer Commanding a Native Cavalry Regiment in which it has now been in force for a lengthened period. Certainly their horses look well and the work which they are enabled to perform is not in any way lessened, but as affecting the subject of this paper let me state that, in this Regiment, which before the adoption of this system suffered greatly from Colic, the cases of Abdominal disease have been reduced to a minimum and the mortality may be said to be Nil. Here then is a practical proof of the value of this method of feeding. To ensure success let me give an outline of the method which should be adopted in preparing the food. If soaked in tubs, these should not be more than half filled with gram and the water should not come higher than ¾ of the tub. If more is put in, the gram will be found to have overflowed. Six hours is sufficient for soaking, by which time every grain that is of any value will be found to have germinated. In the summer when the temperature is high, 4 hours will be found quite sufficient and we may lay it down as a rule that it should be soaked for 6 hours we must then allow less time in ratio to the rise in the Thermometer to 100° F. In filling the tubs the grain should be lightly poured in to endeavour to cause the weeviled grains to float, these should invariably be removed. Having soaked the grain, all that now remains to be done is to mix with it the other food such as Ardawa (if given) bran and chopped grass and let it then be at once given, for altho' I have found that gram may be soaked for even 12 hours without fermentation setting in, still if allowed to stand when mixed with other substances it will soon ferment, and, on one occasion when this was done,

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four cases of Colic were admitted into hospital one of which died. If a moderate amount of care is taken, I feel sure that this system of feeding will soon recommend itself to everybody. The objection which has also been raised to this system is that it would be impracticable on the line of march. I have had no opportunity of testing whether it could be carried out or not and therefore can offer no practical opinion on the subject. I cannot however see that the difficulties are insurmountable, an extra pair of bullocks and a cart might be necessary, in order to convey the troughs or tubs, but this would be but a small matter if the health of horses was maintained and the mortality reduced.

Allusion has above been made to chopped grass, this is a safeguard against horses bolting their food and ensures mastication, without which we are certain to produce derangement of intestinal organs. A certain quantity should therefore always be mixed with each feed. Care must however be taken that it is properly blended, as it will naturally have no effect if simply laid on the food as I have seen done.

With reference to regularity of feeding nothing need be said, as the troop horse, as a rule, has nothing to complain of in this respect, but with reference to the number of feeds which should daily be given, a few remarks may be necessary. It will be remembered that when speaking of the anatomy of the stomach I laid some stress on the fact that the capacity of this organ in the horse. was very small. This then would point to the value of feeding horses frequently and as a rule I prefer that the grain should be given four instead of three times daily, arranging the hours so that water can always be given before hand. A long interval between feeding hours makes horses voracious, causes them in their eagerness to appease hunger, to bolt their food, which as before stated produces indigestion and Colic, which is attended at times with fatal results. The grass or hay should be divided into four *equal* parts. The system of giving a large feed of a night is injurious, this certainly is a horse's largest fast and could we endue him with powers of reason, the results might be beneficial but unfortunately this does not lie in our power, a small early feed in the summer months is then of value, well understood that it be given under European supervision if owing to the early hour this is impracticable then it had better be omitted. As will hereafter be shewn, the organs of digestion are not as active in the summer months as they are in the cold season, then I prefer feeding five times if possible. Overloading the stomach or intestines either with water or food will always lead to their derangement, therefore as was recommended when speaking of watering, let it be a maxim that food should be given often and in small quantites.

Individual horses may require different treatment and I always consider it a proof of a well managed stable when I see arrangements made whereby any peculiarity which a horse may possess is guarded against, for example, I would cite a horse that is a very slow feeder, his

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neighbour, perhaps a voracious eater, will steal his corn. To guard against this let a spare stall intervene. These and other minutiae which of course cannot be particularised will at once stamp the stable management as either good or bad.

Having now concluded my remarks on Food and the best mode of giving it, I shall append a short summary of the points most worthy of notice.

1*st* We must ascertain that we are giving food commensurate to the work performed, that is that it is neither in excess nor too little.

2*nd* That it be given in the most digestible form.

3*rd.* That we ascertain that the forage is of good quality.

4*th* That regularity and frequency of feeding are likely to be followed by beneficial results.

5*th* That great care and supervision must be exercised; without which no system of feeding, however good it may be, can possibly succeed.

I have whilst on the subject of food given the general outline by which we should be guided in feeding large bodies of horses, any deviation from the physiological laws laid down must naturally cause some derangement of the digestive organs. It is not however my intention now to treat on the subject of the diseases arising from bad feeding as this will be more fully discussed when treating on disease which will form the concluding chapter of the present paper; but I shall endeavour to shew in a general manner how these maladies are brought about. 1st, by excess of food. When taken in too large quantities, food cannot be absorbed—the stomach by being over-distended produces paralysis of its muscular coat—the peristaltic action is interfered with and indigestion follows—the food by being exposed to heat and moisture soon undergoes decomposition, and gas being eliminated from it, flatulence is the result. Food also by being given in large quantities and remaining undigested is likely to lodge in the Colon and produce impaction and death. But frequently the putrid substances arising from decomposition of food in the Stomach are absorbed, then febrile symptoms are present, and in fact we may look at the horse thus affected as suffering from blood poisoning.

If food containing a large quantity of Nitrogenous matter be given and but little exercise is allowed, plethora results, congestion of the liver follows, causing ultimately the suspension of the secretion of Bile and consequent interference with the digestive process.

Too large a proportion of starch-gum or sugar will also induce plethora giving rise to indigestion and flatulence.

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Food, deficient in Nutritive properties will frequently contain a large amount of indigestible matter, this, by causing irritation of the Mucous Membrane will lead to Diarrhœa, Colic and other more formidable results.

I shall now at once pass on to consider the effects which climate exercises on digestion. That it does exercise a marked effect cannot be denied. The two most severe enzöotic outbreaks of abdominal disease which I have had to combat in India occurred during the months of July and January, the former when the temperature was 102°F in the Stable, the latter when it was below freezing point and altho' it must be granted that other circumstances greatly influenced these outbreaks, still I feel convinced that temperature assisted in a marked degree. In alluding to this subject we shall have to consider it under two headings.

1*st.* Effects of Temperature on the Body.

2*nd.* Change of Climate as affecting imported animals.

We have before seen that pure air is indispensable to health, can it therefore be doubted that temperature which exercises a well known influence on the atmosphere, will also exercise its effects on the various organs, I think it would be bold to deny it. The effects of heat are generally depressing and exhausting, there is less vigour of the body taken as a whole. During excessive heat the air is highly rarified, the amount of oxygen is lessened and the various tissues of the body are thereby deprived of one of the most necessary elements. Muscular power is thereby greatly lessened and if we remember that perfect digestion is brought about by the peristaltic action of the Muscular coat of the Stomach and intestines, we shall then have a strong physiological reason for believing that heat materially affects this process. We know the effects caused by heat on ourselves, our appetite is less and we evince a marked distaste for animal food; there is undoubtedly some influence exercised on the liver, during the summer months we have repeated proofs of the functional derangement of this organ especially among our Waler remounts: Dr. Murchison in his work on the liver says "experiment has shewn that the effects of a high temperature upon the lower animals is to produce a degeneration of the parenchyma of the liver, its secreting cells become filled with minute granules, presenting appearances similar to those found after death from febrile disease." If therefore this is the case, herein lies a strong argument why digestion is weakened by heat, for, as has been shewn, Bile materially assists the food to become fit for assimilation. If therefore the liver is deranged indigestion in some form must necessarily follow. Against the effects of heat we can suggest no preventive measures but as being a cause, inducive to diseases of the digestive organs, it has been here mentioned.

Cold will also frequently cause indigestion both directly and indirectly, directly by causing a cessation of the action of the skin

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whereby a greater volumn of blood is sent to the internal viscera. The effect of cold on horses made to stand on parade of a winter's morning is well known, their coats stare, they present a tucked up appearance and are frequently afterwards admitted into the Infirmary suffering from Colic. Indirectly through the medium of the water. Water which has been long drawn and left standing in a trough is at times during the winter months icy cold as has been already shewn a large draught will cause a cessation of the Secretion of the Gastric Juice and consequent derangement of digestive functions, so a sudden chill is known to be most prejudicial. The effect of leaving a horse standing, when brought in wet, has before been noticed and I may mention a case that was brought under my treatment some years since as an example. A thoroughbred horse was brought in from the hunting field covered with lather, he was allowed to stand unattended opposite an open door, the result being an attack of Colic of a severe character from which he ultimately died. The Post Mortem examination revealed a contraction of the Ileum about a foot in length, the intestine being so hard and contracted as to prevent the passage of one's little finger inside.

Let us now pass on to cursorily notice the effect of change of climate. It can be readily understood that horses removed from a temperate to a tropical climate will be rendered thereby liable to disease, until their system has so far adapted itself to the climate, that the various organs accommodate themselves to the great heat or, in other words, until they have become acclimatized. Young horses are more susceptible to the influence of a change of climate and we have daily proof of this in our Waler Remounts, we know how subject they are during their first year or two of residence in the plains of India, to derangement of the liver, in many cases accompanied by Colic and in all by serious interference with digestive powers, the latter in some instances to such an extent as to prove fatal.

Change of weather either through a sudden elevation or a lowering in the temperature or through a severe storm has been frequently proved to be instrumental in producing diseases especially those known as enzöotic. Whether such changes affect digestion or not I am not in a position to prove but it is my firm belief that they do. I have noticed that after any sudden rise or fall of the thermometer or after a severe storm especially if accompanied by rain, diseases of the intestinal organs are very frequent, my observations however not being complete on this subject I cannot at present bring statistics forward in proof of this assertion. Returns containing the direction of the wind; the temperature and rainfall before and at the time of an outbreak of enteric disease accompanied by any meteorological remarks worthy of note would prove most interesting and instructive. The value of statistics of this description would be immense and might throw some light on a class of disease which increases the mortality in India to such a great extent.

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I cannot bring this subject to a close without mentioning the effect that constitution and age have on the digestive organs. By constitution we mean that peculiar diathesis or condition of the body which according to whether it be good or bad enables every particular organ to carry on its functions properly. Horses of weak constitutions either natural or brought about by disease, or horses in low condition through other causes, are most susceptible to abdominal disease, besides which when the vital strength is so weakened as it is in these cases, the power of resistance against disease is lessened and therefore we have amongst horses of this description a high rate of mortality.

Age also exerts it's influence on digestion, and statistics will plainly prove that the mortality arising from indigestion and its results, will be greater amongst a body of horses in which the average age is high than in one in which it is either moderate or low.

We have now considered the various points which mostly tend to produce diseases of digestive organs. We have studied the water and food, and seen the results which arise from improper attention being paid to these two most important subjects; we have also shewn the effects on these organs produced by climate, age and constitution. It has not been necessary on all occasions to point out preventive measures to be adopted, as the bare mention of the causes of these diseases will be sufficient to enable us either to avoid their occurrence or if not in human power to do so (and it must be granted that some causes are far beyond) we may adopt such measures which will be instrumental in reducing the severity of their effects. It now becomes our duty to enquire what these diseases are, to point out their causes of which however a few words will ordinarily suffice, as they have before been thoroughly entered into: we shall then point out the symptoms by which we are able to recognize them and finally we shall have to consider the best prophylactic and medical treatment to be adopted. Diseases of the digestive organs will of course mainly absorb our attention but others also as indirectly caused by indigestion will have to be alluded to. I shall commence by noticing diseases of the mouth and then continue to speak of the various maladies of the different organs in their proper course.

Diseases of the mouth are rare in the horse, there are however, those diseases and accidents which will give rise to indigestion, which must be enquired into, I allude to Lampas—Aphtha and wounds in general, especially of the Tongue.

Lampas. Causes. When occurring in young horses, teething as a rule may be looked upon as the exciting cause, and as such, lampas can be considered as a predisposing cause of indigestion, as it interferes with mastication, conversely, however, when occurring in adult life, indigestion must be considered as giving rise to this inflammatory condition of the Bars of the mouth. A disordered state of the stomach will give rise to this abnormal condition. The Bars are composed as before mentioned of a dense fibrous member containing a remarkably developed network of vessels which as stated by Fleming in his "Comparative Anatomy" constitutes a veritable erectile

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tissue, it will therefore be understood how readily the parts become inflamed.

On the subject of Treatment little need be said. If our patient is a young horse and dentition is the cause, we can at once see that treatment will be of little avail as we cannot eradicate that which is giving rise to it, our aim should however be to palliate the evil by giving soft nourishing food, and a simple solution of Alum and Borax applied to the part is all that will be necessary. In cases of great severity arising from teething I have occasionally scarified the Bars, which certainly gave relief. In performing this operation care must however be taken not to wound the Palatine Arteries which run parallel to each other close to the Molar teeth, but unite behind and between the two centre incisor teeth. If lampas occurs in old horses we must look upon digestion as being at fault, the method as recommended above may be adopted but in addition we shall derive benefit by giving the following. R. Aloes Barb zii. Soda Bicarb zi, massa Comm: q. s. ut. f. bol.

Aphtha. This malady is of rare occurrence in the horse, but one or two cases having been brought to my notice lately it is thought advisable to mention it. Causes. Like Lampas it either causes or is caused by indigestion. When occurring from dentition it may then be said to be the active agent, as by the soreness of the mouth mastication is much impaired and by the vesicles extending to the Pharynx deglutition is a matter of difficulty. When in adult life Aphtha appears then the cause must be sought for in disordered stomach.

SYMPTOMS. White vesicles on the tongue and lips. They usually soften in the centre and discharge a glutinous fluid. There is difficulty in mastication and deglutition, a ropy discharge of saliva is generally seen issuing from the mouth.

TREATMENT. Cool astringent washes to the parts affected such as Alum and Borax, will be found very useful. When arising from disordered stomach Alteratives and Antacids should be given; should Ulcers form when the vesicles burst, they should be dressed with a Sol: of Zinci Sulph. and Borax. We must also consider the food, in all cases succulent diet should be given, but we must look further into the cause when Aphtha owes its origin to indigestion: we may, and will in all probability discover the cause to be improper food, to prevent a recurrence therefore of the disease, a change of diet is indicated.

The wounds and accidents which we are generally called upon to attend are those arising from the Bits. They consist of injuries to the lower jaw just behind the incisor teeth even terminating in fracture of this part of the face, and lacerations of the tongue. The treatment will alone consist of keeping the parts clean and giving succulent diet. In fracture of the Jaw after having placed the parts in apposition, it is only necessary to bandage carefully, and a muzzle being placed on sufficiently

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tightly to prevent the horse moving his Jaw to too great an extent, will aid the reparative process, succulent diet being given, unison may be looked forward to in a few weeks.

These injuries should but seldom happen; they remove a horse for a period from his work whilst under treatment, and by their interference with digestion, unfit him to resume his duties even for some little time afterwards.

We must now proceed to enquire into diseases of the teeth. It has been physiologically shewn that mastication is of primary importance in the digestive process; without it the flow of Saliva is lessened and the gastric juice is unable to act upon the food, it will therefore be at once seen that anything interfering with these important structures must necessarily tend to produce indigestion. Let us see what these are. They may be divided into those which are natural to the animal and into those in which structural changes have taken place in the teeth.

Amongst the natural may be classed Parrot mouth and irregularities such as a Molar tooth growing to a great length owing to the tooth with which it should have been in apposition, having been removed. In addition to this, owing to a difference in the width of the upper and lower jaws, the outer margins of the Superior Molars and the inner margins of the lower Molars become long and sharp. This will produce excoriations of the lips and tongue, and, through the pain caused during the process of mastication, the horse will learn to bolt his food.

We have still to enquire into the Structural changes which take place in the teeth. Caries is unquestionably the most frequent. It consists of degeneration of the Enamel and dentine, altho' the fang covered as it is with Crusta Petrosa also at times becomes thus affected.

SYMPTOMS. Frequently a horse is admitted to the Infirmary in very low condition and suffering from indigestion, shewn by the fœces being composed of undigested food,—remedial measures are adopted but fail. If then we examine the teeth we shall in all probability find them to be at fault; attendance to them will make a rapid difference in the appearance of our patient and therefore it should always be a rule on these occasions to examine the teeth. I have even known horses that were admitted to treatment two or three times a month, cured by attention to these simple remedies. The Symptoms which are to be noticed when structural disease is present, are, imperfect mastication, portions of the food rejected, after having been attempted to be masticated, a quantity of grain to be found in the fœces and the horse will have a thoroughly unhealthy appearance.

Let us therefore endeavour to relieve our patient in the following ways. For Parrot Mouth of course no relief can be given, but when we find a Molar tooth of great length, perhaps even pressing upon the roof of the upper Jaw, it then becomes imperative to remove it. This is

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done by use of a guarded chisel, the best being that invented by Mr. Going; but let us not be deterred from performing this simple operation and giving our patient relief because this instrument is not at hand. It can be performed with an ordinary chisel and hammer, and we therefore have it always in our power to relieve our patient from very great pain.

The extra growth of the edges of the teeth is best counteracted by the use of the rasp.

The removal of a carious tooth is a matter more difficult to accomplish than the two above mentioned, but still it must be done. The great fear in the extraction of a Molar tooth, is, that fracture of the Jaw will take place We have however Mr. Going's forceps, with which, if care be exercised, the operation may be performed safely.

Enough has been said I trust to prove that the teeth are a great cause of indigestion, and therefore let us not overlook the necessity of examining them, especially in old horses. Cases are on record of horses having been destroyed for glanders and, on post mortem examinations being made, it has been discovered that the fang of a Molar had become decayed and a sinus communicating with the head had resulted, causing the offensive nasal discharge to be mistaken for the discharge of Glanders. Here then are cases in which, had examination of the teeth taken place, the lives of horses might have been saved.

Next let us consider the diseases to which the Salivary glands are subject. They are mainly Salivary Calculi, and open ducts. It will be at once seen that anything interfering with the regular flow of Saliva must necessarily interfere with digestion. Salivary Calculi are mainly to be found in the Parotid duct, the treatment must consist in either their removal into the mouth by manipulation, or, if this cannot be effected, by opening, the duct which is however always troublesome to heal up afterwards; this operation should therefore be resorted to but as a last resource. Whether opened for the purpose of removing a calculus or whether it is opened by an accident we must necessarily have a discharge of Saliva which naturally increases during mastication. The treatment must consist of closing the wound with a Suture, and applying Collodion over the part: keep the animal without food for some hours, and then only gruel must be subsequently given. The patient must be prevented from eating his bedding by a muzzle being applied. Should the wound be unwilling to heal, a blister around the part will frequently have the effect of closing it. There are however more complicated cases, such as obliteration of the portion of the duct extending from the wound to the mouth; the consideration of these cases however would, I feel, be beyond the limits of the present paper.

We must now pass on to notice the disorders to which the Pharynx and Œsophagus are liable. They are mainly due to obstructions which may be either mechanical or structural.—Under the first

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heading we shall have to speak of Choking and under the latter of constriction and dilatation of the muscular tube.

CAUSES. When speaking of the Method of feeding, it was then urged that, feeding from the ground was by far preferable to feeding from mangers. It was further explained that the flow of Saliva was thus facilitated, whereby the food was softened, and that from the pendulous position of the head, horses were less able to bolt their food. Since the adoption of this system, I have not a single case of Choking on record which can be traced to mechanical obstruction, but on the contrary I can point to an instance in which a horse that through structural change of the Œsophagus was constantly admitted into the Infirmary with symptoms of choking, was afterwards cured by being fed from the ground with the grain spread over a large surface.

Imperfect mastication through diseases of the teeth is very liable to produce choking.

Imperfect salivation through disease of Salivary glands also will cause it, and voracious feeders, especially those fed on dry food, are more liable to it than other horses, and, therefore, in this we find I think, another beneficial result from the administration of soaked gram.

I have not alluded to obstruction of the Œsophagus by such substances as Balls; hard pieces of root &c. all of which are instrumental in causing choking; but these I have never seen in the Service and they are such as should never be allowed to occur.

The structural diseases of the Œsophagus are constriction with consequent dilatation above the part. Constriction also of the orifice at the cardiac opening is one that has been recorded, and a horse under my treatment at present presents all the symptoms which would naturally arise from this lesion. Either of these will give rise to symptoms of choking.

SYMPTOMS. A horse will suddenly leave off feeding and will make violent efforts to get rid of the offending matter; a great flow of saliva will be issuing from his mouth. The muscles of the neck will be spasmodically drawn up; if he partakes of water it will return through the Nostrils, should relief not be given soon, great distress will follow and the patient will soon be covered with cold sweats. These symptoms will be either diminished or increased in severity according to the situation of the obstruction. If it lies in the Pharynx violent fits of coughing will ensue.

TREATMENT. This will vary according to the position of the offending mass. If in the Pharrynx, endeavours must be made to remove it with the hand. If in the Œsophagus we must endeavour by manipulation to so break it up that it can be passed down. If however, in

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the Thoracic portion, it is beyond our reach except through the probang. Our endeavours will at all times be greatly assisted by administering small doses of oil at frequent intervals, and especially when the food has been given in a dry state. This simple remedy will obviate the use of the probang on many occasions, which is always advisable. In those cases, however, where the obstruction cannot be removed by manipulation, let sufficient time elapse to allow the small doses of oil to remove it if possible. Should this then prove ineffectual we must have recourse to the probang—let it be used, but not abused. The œsophagus is a tube composed of a delicate mucous membrane with a Muscular outer covering and it will not bear rough usage. If therefore an obstruction is felt with the probang let care and patience must be exercised, as force will either cause a laceration of the living membrane or even a thorough rupture of the tube itself. Should the removal of the offending material be impracticable by the means above alluded to and should it be situated in the cervical portion we must have recourse to Œsophagotomy an easy operation in itself, but one in which great care has to be exercised not to wound the surrounding structures as in this portion of the neck we have the jugular veins, carotid arteries—and par vagum and other nerves. Having divided the skin just over the part where the obstruction is, an opening should be made in the Œsophagus to allow of the removal of the offending substance a little tepid water should then be injected and the lips of the Œsophageal wound brought into contact with a suture, the same to be done with external wound, the patient then to be fed on thick gurel and he will, under ordinary circumstances, do well.

I have given a sketch of the treatment which should be adopted, but in this as in other diseases the old maxim that prevention is better than cure is fully exemplified, and with the facilities to prevent its appearance, choking should seldom if ever be known in the Service. Should a sporadic case occur, it may be difficult to account for, but as sure as it assumes an enzöotic type so certain is there to be something amiss in either stable management or feeding. Let us therefore enquire into these matters and remove the cause—no repetition then of these cases will occur.

We now arrive at the study of the more important diseases of the digestive organs viz: the stomach and intestines. It is on these that food exercises its influence and to the derangement of their functions Indigestion owes its origin. Let us stop to ask ourselves what is Indigestion? It is a perverted action of some of these organs producing a difficult and imperfect converson of food into nutriment. If this is the case what is the seat of indigestion. In the horse, as has been shewn the stomach is of small capacity, the food does not remain long in it but passes on into the intestines where it undergoes further changes, the assimilable portions becoming absorbed whilst those more indigestible are expelled with the fœces. In man and ruminantia the Stomach plays a more important part in digestion, in the horse however

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the Intestines must be looked upon as the chief organs implicated when dyspepsia is the result. If we look upon Indigestion as a disease *per se* we must do so as a milder form of other abdominal diseases of greater severity, for a continuance of the causes which give rise to it will induce severe diarrhœa and constipation which in their turn may bring about other more serious complications of the stomach and intestines even terminating fatally at times. That it does occur as a disease *per se* we have daily proof of, and the Symptoms which it gives rise to, will be recognizable by every one accustomed to horses. Let us enumerate some of the causes; to record them all would be to enumerate the whole of the faults in stable management and feeding, contained in the foregoing pages. The most important are. Want of exercise, want of grooming, imperfect mastication or a difficult flow of Saliva. Food of improper quality, food given at uncertain or long intervals, constitutional debility. diseases of the liver. In one or two cases also which have come under my notice, the symptoms indicative of this disease were precursors of Phthisis.

SYMPTOMS. The horse will assume a thriftless appearance and altho' perhaps he may have a voracious appetite, still he will fall away in condition, in addition his appetite may be depraved, his coat will be dry and staring and the animal will be hide-bound. Loss of appetite may be present, so also he may at times be tympanitic and shew symptoms of Colic.

Constipation or diarrhœa or both, alternately may exist and if we examine the fœces we shall find evidence of indigestion by seeing grains of gram or barley being voided totally unacted on by any abdominal secretion. A cough at times accompanies these Symptoms.

Treatment will be mainly prophylactic, for unless we investigate and remove the cause, success cannot result. Let us carefully enquire into the forage and the way in which it is given and if we find much whole grain voided with the fœces, the teeth should be examined. Having corrected or removed the cause, we must first try to palliate the urgent symptoms which may be present and then restore the tone of the stomach and intestines. To commence with, a change of diet will be necessary and if green forage is obtainable it should be given. In palliating the urgent symptoms we must be guided by whatever accidental combinations may at the time present themselves. If constipation be present a mild dose of aperient medicine in combination with Alkalies to counteract acidity will be useful. If on the contrary there is Diarrhœa, the following will be useful. R. Linseed oil, 1 pint, Tincture of opium 1½ oz. Having now overcome the more urgent symptoms we must endeavour to restore the tone of the organs affected and to accomplish this end Tonics are required. Iron however does not seem to meet these cases, causing, as it always does, constipation. I have found the Mineral Acids of great value and would recommend their use. Sulphuric Acid 1 drachm in combination with some Vegetable Tonic such as

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Tinct Gentian: the whole largely diluted with water will be followed with good results.

We have now arrived at the consideration of the diseases to which the Stomach is liable and will have to remark on the following, Tympanitis. Impaction of the Stomach, Rupture, Parasites and Gastritis. I have placed them in the above order so as better to classify them. The three first are in a measure preventible, that is, they are due either to improper feeding or bad quality of forage. The 4th is beyond our control whilst the last is one very seldom met with, and when it does occur it usually is traceable to some poisonous substances.

TYMPANITIS. Signifying a drum like condition of the abdomen.

CAUSES. As a rule green forage is very liable to produce this disorder, but food of any indigestible character, which may remain in the stomach or intestines for a lengthened period will, under the influence of heat and moisture, undergo decomposition and cause Tympanitis. The large number of cases on the March of the British Army from Waterloo to Paris in 1815 are reported by Mr. Percivall in his work Hippopathology to have been caused by these animals being allowed to feed in a field of growing wheat. Crib biters and windsuckers are very susceptible to this disease, they are frequently being admitted to the Infirmary thoroughly blown out. These must be looked upon as chronic cases and in them functional and even structural derangements of the stomach and intestines follow as a natural consequence. Cases have presented themselves to me in which the symptoms have been very aggravated and to which no relief could be afforded or no cause given—in these, Post Mortem examination has revealed some obstruction in the intestines.

SYMPTOMS. The disease is easily recognized from the dilated condition of the Abdomen, let it not however be mistaken for ascites of which. we shall have to speak hereafter. The sound on percussion in this disease is clear and not dull as in ascites, in addition to which there is no fluctuation. The attack usually comes on suddenly—the horse appears uneasy, begins to paw, then lies down and rolls as if suffering from Colic. Should relief not be given, the pain will become intense—the breathing hurried and difficult—the pulse small and thready, and our patient will die either from Asphyxia or from a rupture of some portion of the intestinal canal.

TREATMENT. Our attention must be directed to evacuate the food which is eliminating the gasses—we must also endeavour to neutralize these gasses which are giving rise to the pain, but in addition to this in chronic cases we must also endeavour, if possible, to restore the lost tone of the stomach and intestines. The first end will be best accomplished by administering a dose of purgative medicine together with Lig: Ammoniæ 1oz. In administering this medicine let me however impress on my readers the necessity, which exists for its dilution with at least a pint of water, for, if given with a lesser quantity, it is certain to excoriate

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the mouth severely. Walking exercise—handrubbing the abdomen and enemata will all aid us in evacuating the gas. Should however these remedies fail, death, as before stated, will speedily follow—it therefore becomes our duty to afford mechanical relief. The operation of Paracentesis abdominis is one very simple and still effectual. The perforation should be at the most prominent part of the swelling and is performed with the trochar and canula; if however this instrument is not at hand an ordinary penknife and hollow tube of any sort will suffice—let us remember that unless relief is given, our patient must die and let this therefore embolden us in giving relief.

Having succeeded in neutralizing the gasses through the administration of medicine or in causing their evacuation by mechanical means it only remains for us to consider what should be done in chronic cases to improve the muscular tone of the stomach and intestines which has become impaired. The tonics, such as recommended in Indigestion, will prove useful. In salt I have found a useful corrective—by its stomachic and antiseptic properties it tends to prevent the formation and accumulation of Gas. Having cured our patient of the attack we must endeavour to prevent its recurrence. Green food must be studiously avoided, with reference to those cases arising from wind-sucking and crib-biting it would be beyond the limits of this paper to enter into the discussion of the best methods of preventing these pernicious habits.

IMPACTION as in Tympanitis so in Impaction we must consider it as affecting both the stomach and intestines. This disease is certainly one which in most cases is preventible. It arises from a horse being called upon to fast for a number of hours—on return to the stable with a voracious appetite he is inclined to bolt his food, little further harm than an attack of colic will however arise if the feed be small. Let us therefore never give a big feed to make up for a long fast, small quantities given often will prevent the occurrence of this fatal malady. This disease has frequently been termed "Stomach Staggers.' From the intimate connection of the Stomach with the Brain it can be readily understood that this latter organ would become affected; still this is not always the case—deaths have occurred in my practice in which the stomach has been found enormously distended and still no cerebral symptoms have been present, and on, the contrary, in a case in which the stomach was found to contain but little food, but which on the other hand presented together with the intestines evidences of acute inflammation, the patient died in a rabid state.

SYMPTOMS. Our first duty in all these cases is to make a searching enquiry into their history, as by this alone we must be guided in our treatment. The first symptoms will be those of Colic, the animal appears to be very uneasy at the outset, the pulse will not be much altered but as the disease progresses it will be quickened and become harder in character. In cases in which no cerebral symptoms are present, there will be great constipation, respiration will become increased,

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the horse will reel about and shew symptoms of the most acute pain; should he live sufficiently long to allow of a dose of physic acting it will be noticed that although a large dose may have been administered it will have little effect; suddenly perhaps the horse will fall down and after a few convulsive struggles will die—rupture either of the stomach or intestines frequently occurs before death. In a case lately brought to my notice in which impaction of the colon was found, a rupture of the coats of the Ileum had taken place. In most of these cases a return of food through the nostrils is noticed but as will hereafter be shewn this must not be looked upon as a diagnostic symptom of this lesion having taken place. In cases wherein Cerebral symptoms are present, although I must confess they form the minority in this country, —the horse is heavy and drowsy at first, but suddenly awakes from his lethargy and violently plunges about, paws violently and becomes an object of danger to those around him. The pulse instead of being accelerated becomes slow, severe constipation is also present.

TREATMENT. Our aim must be to get rid of the offending matters as speedily as possible and to accomplish this an aloetic purge is necessary. The best form to administer it, is in solution, which can be made as follows. Alœs 1oz: water 7 oz: Proof spirit 1 oz: dissolve the aloes in the water then add the spirit. In this form 6ozs: may be given, combined with a stimulant it will be found to act more readily than if given in a Ball. Frequent enemata must be given and handrubbing the abdomen will be found useful. In both Tympanitis and Impaction, care should at all times be exercised to prevent the horse throwing himself violently down as no surer mode of producing Rupture of the stomach than this can possibly exist.

Rupture of the stomach may be looked upon as a sequence of the foregoing, but still we must look further and ask ourselves, does not this lesion frequently arise without either being present. To this I would certainly reply in the affirmative. Cases denoting great abdominal pain have occurred in great numbers in which there was but little food in the stomach and intestines: the post mortem examination however revealed an ulcerated condition of the mucous lining membrane of the stomach at that part where the Cuticular and villous portions join; the muscular coat being at the same time much attenuated. On carefully examining the register, no trace of an entry could be found against many of these horses for abdominal disease. This leads me to ask cannot subacute disease leading to Ulceration and consequent weakening of the coats exist for a considerable time without our being cognizant of the fact, my experience would certainly lead me to believe that it can. In many of these cases I feel sure, that the rupture is caused either by the severe falls sustained by an animal when suffering from an acute attack, or when constipation is present, this lesion may be due to violent straining as the following case will shew. An old Horse, in very low condition, was admitted to the Infirmary shewing slight abdominal pain. I was there at the time

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and noticed that he strained violently when only one or two hard pellets were voided, but immediately after, a great quantity of ingesta was returned through the nostrils and the animal died in half an hour from Ruptured stomach. As has been shewn coarse roots of grass will penetrate the covering of this organ and cause death—any sharp hard substance will have the same effect, for example one case which at present occurs to me was caused by a piece of stick which not only penetrated the stomach but also the Diaphragm and lungs.

SYMPTOMS. The two pathognomic Symptoms usually described to this lesion are. Vomition and the peculiar attitude assumed by the patient, viz: that of sitting on his haunches like a dog. With these as diagnostic symptoms I cannot agree, for they have been present in many cases which have been under my care when rupture of the Stomach has not occurred. The first I have noticed in cases of Rupture of the Ileum, Colon and Diaphragm but I have noticed that when this lesion has taken place in the Stomach the quantity returned is much greater, and that whilst in other cases it consists mainly of fluid, in rupture of the Stomach ingesta forms a greater portion. I would therefore look upon these symptoms rather as denoting grave lesions and speedy death than as diagnostic of ruptured Stomach. In addition to these the Pulse will be weak and fluttering and become more imperceptible every moment. Pain will be intense, strength will gradually fail and cold sweats cover the body. Respiration will be hurried, and, in one case that I now can recall to memory, the patient died in a delirious state. Violent eructations generally are noticeable.

TREATMENT. None will of course avail, our remedies must be purely preventive. In the list of causes given above, overfilling the Stomach was pointed out as being a fruitful source, large draughts of water must be herein included, as cases which can be traced to this are on record.

We must now pass on to notice the Parasites which inhabit the Stomach and their effect on the general health and also on the coats of the organ. These consisting of Bots are the result of the ova of the Œstrus Equi and affect horses to a great extent in this country, they pass through a regular stage, their eggs are deposited on the Skin during the summer, are licked off by the horse and become attached by their tentacula (two in number) which are situated close to their head to the Mucous coat of the stomach. Here they remain until the next spring when gradually losing their hold, they are expelled with the fœces and soon form a chrysalis out of which the Gadfly escapes. It will be noticed that I stated above that they are attached to the Mucous Coat, it is usual to describe them as being fixed to its Cuticular portion, but I have seen such numbers on the Villous portion, that I am compelled to dissent from this description, to this I attach some importance, as I believe they are productive of more harm in this situation than when

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simply attached to the Cuticular, this will lead us to consider what effects they produce. It used to be generally believed that they were innocuous, closer observation has however lately proved that they do at times produce ill effects and with this latter opinion I thoroughly coincide. Let us first note their effect on the general health. Mr. Gamgee, who devoted some time to their study, relates that he bought two batches of horses from the same person in France, one of which had been kept in the stable and fed on coarse hay, the other being at the time of purchase out at grass, where they were more exposed to the flies than those in stables. He then proceeds to state that the former were in very poor condition whilst those that had been at grass seemed in better order and more muscular, they were both treated alike but the latter lost condition, could not stand work, and their legs swelled altho' they were liberally fed: from these he obtained a great number of bots. This I think is sufficient evidence to prove that they are not innocuous. From their mode of attachment, their heads are buried in the Mucous coat, it would therefore appear that it is from this membrane that they derive their nourishment. If this statement be correct, they must necessarily lessen the quantity of Mucus which is necessary for digestion, but still further when they are located on the Villous or true secreting portion of this membrane, they deprive the food of the Gastric Juice without which assimilation must be imperfect. With regard to their effects on the coats of the stomach, I cannot say that I am of opinion that they tend to weaken them as in the numerous cases of Rupture of this organ which I have seen, not a single one was lacerated in that portion mostly affected with Bots, their effects therefore must be looked upon more as general than local.

TREATMENT proves of no avail, these larvæ are so firmly attached to the interior of the stomach that it requires great force to remove them, in fact in doing so the mucous membrane is generally torn. It will be readily understood that having such a secure hold and their heads being imbedded in the mucous membrane, no medicine can possibly dislodge them. Our only means of preventing their accumulation is to endeavour to keep the horses as free as we can of the Œstrus Equi and to remove any, once seen on the skin.

GASTRITIS. Or inflammation of the stomach on; this subject I shall offer but few remarks. In the acute form, this disease has never come under my notice in the service, either at Home or in India, that it does exist in a subacute or chronic form I fully believe as otherwise it would be difficult to account for the ulcerated state of the mucous membrane of the stomach in many cases of Rupture of this organ. In cases where it assumes an acute type it is generally due to some chemical irritant or poison such as Arsenic &c. I select this agent from many others as I remember a case, which occurred some time before I entered the Service, in which arsenious Acid had been administered. Death resulted and the postmortem examination disclosed the stomach to be highly inflamed, eroded in some places and actually eaten through in others.

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SYMPTOMS. I know of no diagnostic symptom of this disease. Those usually denoting severe abdominal pain will be present, but they will vary according to the irritant which has given rise to the disease; for example, if the compounds of mercury have been administered profuse salivation will be noticed.

TREATMENT. In a case of this description we feel the loss of emetics, were we able to produce vomition in the horse, we would be greatly assisted. Our aim must therefore be to endeavour to discover the cause of the disease and then to administer an antidote to neutralize its effects. In doing so we must of course be guided by whatever poison has been given and if this cannot be discovered, must be guided by the symptoms presented, to enable us to decide whether it is of an irritant or narcotic nature; it would of course be beyond the limits of the present paper to enter into a lengthened list of antidotes but a few general rules may be of service.

ACIDS. Carbonate of lime—common chalk or even the whitewash from a wall if the symptoms are urgent.

NARCOTICS. Are best treated by a free use of stimulants, and exercise to prevent stupor; cold effusions as a shock are useful.

MERCURY. White of eggs, flour, and water.

LEAD. Sulphate of Magnesia.

ZINC. Milk and Magnesia.

ARSENIC. Hydrated sesquioxide of Iron. Powdered charcoal has been found useful and is generally at hand.

Having now considered the diseases to which the stomach is liable, we must pass on to note those of the intestines. It will be unnecessary to speak of Tympanitis or Impaction as affecting these organs—they suffer together with the stomach from both—the Colar being frequently the seat of the latter. We shall have to enquire into the following diseases viz:—

Colic, Enteritis, Constipation, Diarrhœa, Superpurgation, Dysentery, Parasites, Rupture, Volvulus, Intussusception, Strangulation, Hernia, Peritonitis and Ascites.

Diseases of the intestines form a large portion of the maladies prevalent in India and frequently assume an enzöotic type, adding, at these times, greatly to the mortality. It can be understood from the remarks which have been made when speaking of the anatomical features of the abdominal viscera that owing to the small size of a horse's stomach, food cannot remain long in this organ but must soon pass into the intestines, there to be acted on by the various secretions.

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From the lengthened period which the food remains in them, diseases of these organs frequently occur especially if it be of an indigestible nature or of inferior quality. In addition to this, from the loose way in which they are attached to the spine, it can be readily understood that during an attack of Colic, accidents may happen. The intestine may become twisted or may break through into various cavities either of which will speedily cause death. No class of disease in the horse requires prompter treatment. An hour gained at the onset is invaluable; it therefore becomes our duty to lose no time in attending to even a mild case of abdominal disease.

COLIC. In considering this malady we shall only have to remark on that form usually denominated spasmodic, as under the head of Sympanitis, that known as Flatulent, has been fully described.

CAUSES. These are at times obscure, but from what has before been said, watering and feeding are by far the most fruitful causes. It would be useless to recapitulate all that has been said but let me remark that sporadic cases can be usually traced to either of these causes, when however it assumes an enzöotic type, we are then called on to enter into a more extensive investigation. The quality of food the hours and method of watering and feeding, the amount of supervision exercised on both these occasions, and further should we be unable to find any flaw we must enquire into stable management—whether horses in winter are sufficiently clothed, whether they are left standing whilst hot, before being groomed. These and any other facts of this nature must be remedied if they exist. I must however admit that some outbreaks defy us; they have fallen to my lot to deal with and after every source which would be liable to induce an outbreak of this description has been enquired into, I have been compelled to admit that the cause was not apparent. Why the troop horse is so liable to Colic is a question difficult of solution; in many instances we are able to define the reason; but in others we are left to walk in the dark. Climatic influences undoubtedly are influential and to this I attribute a great number of outbreaks. It is an undeniable fact that young walers are very liable to attacks of Colic—although they are usually of a mild character. Suffering from the effects of change of Climate, fever results, during which time the various secretions are lessened, thereby inducing constipation which in this country is so frequently a precursor of Colic. These young horses also suffer from Chronic affections of the liver which also tend to the production of this Malady. Should an outbreak present itself at any time and should we be unable to define the cause, it becomes our duty to make such changes as science would direct to endeavour to lessen the severity of the disease.

SYMPTOMS. Those indicative of this disease are so well known that it would be useless to enumerate them. Let us however for a moment consider those which indicate complications to be present. I always look upon a case with suspicion in which relief is not obtained in

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about six hours; should no fœces or urine be passed, it proves that some obstruction exists in the bowels or that spasmodic muscular contraction has not been relieved, for in this abnormal state the neck of the bladder shares. The result of a continuation of either of these is not, as is frequently stated to be, enteritis; of the various casualties which have taken place since my arrival in this country, not a single one has been attributable to this disease, altho' inflammation of the intestines will of course ensue, when Rupture &c. take place. The most frequent results of Colic are Rupture of either Stomach or Intestines, strangulation and unrelieved spasmodic contraction of some portion of the Bowels. The Symptoms indicative of either of these lesions have been or will be described under the various headings.

TREATMENT. As I before stated, in this disease rapidity of action is imperative, should our patient be an entire we should at the onset examine the scrotum carefully and determine whether either inquinal or scrotal hernia exists, as this is frequently the cause of severe abdominal pain in these animals. The end which we should, in cases not thus affected, keep in view must be to remove the cause and at the same time to relieve the Spasm. This is best accomplished by administering 5 drachms of Aloes in solution combined with a stimulant. I have given Lig Ammon: Ammoniæ Carb: Oleum Teribinth and various of the Ethers but I cannot say that I have any favorite, all appear to be equally efficacious. Should the pain be persistent the administration of an Anodyne is indicated and to accomplish this end Tinct: Aconiti or Extract Belladonnæ are useful agents. I generally give the former in doses of from 15 to 20 drops, repeating the dose every hour or two as the case demands. Enemata should be frequently given and in obstinate cases I have obtained good results from Terebinthinated injections. Exercise also should be given, in regulating this remedy I lay it down as a rule that if the horse can walk without being urged violently, then he is to be exercised, if, however, on the contrary he shews any disinclination he is not to be forced, exercise increases the peristaltic action of the intestines and is thereby invaluable. In obstinate cases stimulants to the abdomen should be applied. I invariably use mustard 8 oz. turpentine 4 oz. mixed up to a proper consistence with water, this to be well rubbed in and allowed to remain on for half an hour and then washed off. I have never known the hair to be removed by this remedy. Above everything we should be most careful in seeing that a large quantity of litter is provided and that a man is in constant attendance to shake it up during the intervals of relief from pain, by this means is the horse not only prevented from injuring himself but also such fatal consequences as Ruptured Stomach are less liable to occur when this is attended to. Fluid greatly assists the action of physic and on this account I always recommend a bucket of thin gruel or linseed tea to be placed before the horse to try and induce him to drink. The gruel also acts as a demulcent.

ENTERITIS—on this subject I shall offer but few remarks as it is one which so seldom occurs spontaneously, neither can I endorse the opinion

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of many writers that unrelieved Colic is very liable to terminate in inflammation of the intestines. I remember a case of severe Colic, in which pain continued for 5 days, and in which, after death, a foot of the Ileum was found so contracted as to prevent the insertion of one's little finger, and still no trace of inflammation could be found. It is natural, however, to suppose that the intestines will sympathize with the Stomach and in cases of Gastritis arising from any irritant, Enteritis is very likely to follow. When appearing as a disease, sui generis, it may be traced to some obstruction in the intestines either in the form of concretions, large masses of fœces or strangulation as in hernia &c. The application of water to the Skin when hot, by forcing a large amount of blood to the internal viscera will produce this disease, one case having been lately brought under my notice, in which death took place, I would again remark on the pernicious habit of washing horses under any circumstance.

SYMPTOMS. The great necessity which used to be thought to exist in properly diagnosing cases of inflammation of the intestines from pure Colic, no longer occupies the prominent position which it did. Practice has taught us that the same remedies which are applicable to severe cases of Colic are those which are equally efficacious in Enteritis—promptness of action is of much greater consequence in these cases which so speedily prove fatal—the duration of this disease is variable, but in cases which have been under my care, not purely of enteritis, but coupled with other complications, death ensued in six hours. The symptoms which may be said to be indicative of Enteritis, altho' they cannot be looked upon as diagnostic, are, obstinate constipation—the pain at the onset not of such violent a character as that of Colic, is continuous, altho' I have noticed that it is more severe sometimes than at others, which must be accounted for by a complication of spasm being present. The pulse which in Colic is regular and full except during the paroxysms, becomes quickened, hard and thready. Pain will also be evinced when pressure is applied to the abdomen and, lastly, the patient does not throw himself about so violently. Should no relief be obtained, pain increases rapidly, the horse borders on delirium, the temperature of the Skin is variable and becomes bedewed with cold sweats, the thermometer introduced into the rectum will rise to 109° F, the pulse gradually becomes indistinct, suddenly the pain ceases and death soon results.

TREATMENT. Considering that constipation is an accompanying symptom and that as a rule the disease is due to some irritation caused by food &c. in the intestines, we cannot I think adopt any safer principle than that of administering a full dose of Cathartic Medicine. Authors differ greatly in their opinion on this point, but as I consider it to be a fundamental principle in Medicine that the cause of a disease should be removed if a cure is sought for, I have adopted this method of treatment and give aloes in solution 5 oz. Tinct opii ½ oz. should this prove inefficacious in producing a slight effect on the Bowels I follow it up with

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Calomel ½ dr. Powdered Opium 1 dr. administered every 4 hours. If pain is very great Tinct Aconite 20 drops can be given at intervals. The remarks made when speaking of Colic referring to enemata, stimulants to abdomen and copious supply of gruel are applicable also to enteritis.

We must pass on to notice Constipation, Diarrhœa, Dysentery, and Superpurgation.

These I do not look upon as diseases but rather as symptoms of some change in the functions of the intestinal organs. We should draw a distinction between constipation induced by bad stable management or improper diet and that due to functional derangement of these organs. The first is caused either by want of exercise or by food possessing properties conducive to costiveness and may be remedied by giving more work, or by attention to the laws of diet already laid down.

We must endeavour to discover the causes which exist when constipation is due to functional derangements. It has been already shewn that in both Spasmodic Colic and Enteritis, this state of the bowels is usually present but it may be due to some hepatic disease whereby the secretion of Bile is either lessened or totally arrested. Whatever may be the cause, prompt attention should be paid to this state of the Bowels, for torpidity however slight, if neglected, will be a sure forerunner of more formidable intestinal complications. In these cases unless in great emergency, as laid down when speaking of Colic and Enteritis, the administration of large doses of Cathartic medicine is not indicated. A carefully regulated diet with frequent enemas and small doses of aloes with Calomel 2 scruples are generally sufficient and efficacious.

Diarrhœa in the same way as constipation must be looked upon more as a symptom than a disease. It is simply an effort on the part of the intestines to throw off some indigestible food or other irritating substance or it may be indicative of some morbid condition of the intestines. It is also frequently due to cold whereby the exhalations from the skin are arrested and the secretory powers of the bowels are called upon to preform more than their fair share of work. Heat during the summer mouths likewise is occasionally instrumental in bringing it about.

TREATMENT—this must be regulated by the cause, and therefore it should be our first duty to acquaint ourselves with this; should it arise from any indigestible food we must of course endeavour to remove it and in these cases I have found nothing more useful than Ol. Lini oj Tinct: opii zi. In mild cases medicine frequently is not required, carefully regulated diet will restore the patient to health. An ordinary stimulant in cases induced by cold will frequently be sufficient. In all cases tepid mucilaginous drinks such as gram gruel boiled, should be given, acting as they do as demulcents on the excited mucous membranes. Frequently during the summer months, I have noticed a number of cases occur which are due to deranged hepatic functions, I have generally found these yield to

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Hydrarg c. Creta, given in drachm doses twice daily. In obstinate cases Powdered opium ½ dr. should be given morning and evening. In the Winter months warmth is most desirable, the patient should be well clothed and, if accompanied by pain, I have obtained very good results from stimulants applied externally to the abdomen. Chronic Diarrhœa is frequently caused by mesenteric disease of which it will be necessary to say a few words hereafter.

The above treatment will also apply to Dysentery, a form of disease very rarely seen in the horse and therefore one on which little need be said except, that in bad cases, the Hyposulphite of Soda from its ant-acid and antiseptic properties may be given in ½oz. doses with good effects.

SUPERPURGATION. This form of diarrhœa is but seldom, if ever, seen amongst the horses of the mounted branches of the Service, but as one case has come under my notice I feel the consideration of this portion of the subject would be incomplete without some slight reference to it. The cause is usually an excessive dose of purgative medicine, but an ordinary dose of aloes is liable to produce it in some horses, and therefore it behoves us, unless previously acquainted with the constitution of our patient, to be most careful when prescribing, to avoid the administration of large doses, unless the symptoms be of an urgent nature which would then of course warrant us to do so. The case to which I allude was one in which but 4 drs. of Aloes were given and still superpurgation to a great extent ensued. We must however be careful in not imagining that our patient is suffering from this form of disease because purgation continues for a longer period than usual; whilst the appetite remains good and the pulse is not changed in character we have little to fear; should the animal refuse to feed and the pulse become quicker and thready, then we should act, and, remembering that abdominal diseases run their course quickly, we should act promptly—Tinct: Opii 1 dr. every four hours in a little gruel will generally meet all requirements. Rice water given to the patient will prove beneficial.

It next becomes our duty to consider the parasites which inhabit the intestinal Canal but as a description of the various families would far exceed the limits of the present paper, I shall content myself by simply remarking on their deleterious effects on the horse and shall then enquire into, what remedies are best to cause their expulsion. We shall have to recognize two species, although numerous others could be named; but being most frequently met with, it will be sufficient to name these two—they are the Ascarides Lumbricoides or long round worm, and the Ascaris Vermicularis. The latter being much more hurtful than the former. From the fact that the Lumbricoides are generally seen singly in the fœces, it has been thought that they exist as such in the intestines, such however is not the case for I have found them in large numbers. The Vermicularis I have also found in great profusion, but

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from the fact that the animals in which they have been discovered never shewing any ill effects, being thrifty and sleek in their coats, I am led to believe that they do not cause such an amount of constitutional disturbance as they do in more temperate climates. In England, well do I remember the larger portion of the horses of a Battery looking most thriftless, and on enquiring into the cause I found that the stablemanagement and system of feeding were faultless, but it transpired that numbers were affected with the small threadlike worm which owed its origin it was thought to the water. The source was changed and the animals put under treatment, they soon picked up in condition and looked well.

SYMPTOMS which indicate their presence are—Rough staring coat, loss of flesh, constant whisking of the tail, rubbing it at the roots, discharge of mucus per rectum and occasionally mild paroxysms of Colic may be present, Dyspepsia will frequently be noticed by the animal licking the walls and the earth. But of course no symptom can be so depended upon as the actual presence of parasites in the fœces.

TREATMENT. It is difficult to select the best vermifuge or anthelmintic from the various drugs which from time to time, have been extolled as efficacious. Arsenic, Antimomy, Aconite, Hellebore, Mercury, Salts of Iron, Turpentine, Common Salt and Aloetic Purges, have each had their advocates but I think it is wrong to restrict the treatment of all animals to one alone, we should be entirely guided by the Symptoms presented. In ordinary cases Ol. Terbinth: in ounce doses given in gruel for two or three days and followed by a mild Aloetic purge, will suffice, I cannot speak of Aconite as a vermifuge, I am aware that some practitioners extol it greatly but I have never administered it, if it possesses these properties, its use would be indicated in cases where symptoms denoting intestinal irritation are present. The Sálts of Iron prove very useful when there is great debility, their mode of action being more to restore the general tone of the system and to render it unfit for the habitation of these parasites than to act either as a vermifuge or a vermicide.

A few remarks must now be offered with reference to the results or accidents arising from intestinal derangement, I allude to Rupture of the coats. Intussusception, Strangulation and Herniœ. In alluding to the latter it will be necessary to point out the various forms in which it presents itself, viz: Diaphragmatic, Ventral, Rembilical, Inguinal and Scrotal, with the two latter we are mainly interested as being frequent in this country amongst entire horses.

Rupture—sufficient has been stated when speaking of this lesion of the Stomach to prove that over distention of any part of the intestinal canal will produce rupture of its coats. The causes and symptoms are identical, except that, as was then stated, I have noticed that more food is returned through the nostrils when the Stomach is implicated.

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Treatment of course is of no avail. The intestines which I have found to be generally affected are the Ileum and Colar.

VOLVULUS.—Intussusception and Strangulation. I have classed all these together, as we possess no means whatever of diagnosing one from the other during life and they are all equally fatal. One constant symptom is obstinate constipation which cannot be relieved,

Volvulus or twisted intestine may either be caused during a severe attack of Colic or it may owe its origin to a tumor with a long pedicle winding its way round a portion of the intestine and causing it thereby to become twisted.

Intussusception or the invagniation of one portion of the intestine into the other, occurs more frequently in the smaller intestines but the Cœcum is also similarly affected at times. Cases are on record in which the lesion has been supposed to exist and the patient has recovered. I cannot however claim to have been so fortunate.

HERNIA.—The various forms of this lesion should be considered more as tending to produce intestinal disease than to be produced by it; but still, as will hereafter be shewn, cases do exist where it is a sequence and not a precursor of abdominal derangement. Let us now proceed to enquire into its various forms, and to notice those which are either reducible, irreducible or strangulated. By reducible Hernia we mean a protrusion of some portion of the intestine either through an artificial or natural opening which can be returned into the abdomen—by irreducible is understood a portion of intestine thus protruded which is not replaceable but which at the same time is not constricted—and by strangulated is meant a hernia which is not only irreducible but in which the opening is so constricted or the portion of the intestine itself so enlarged that the Circulation is impeded, and unless relieved by an operation inflammation and mortification speedily supervene.

DIAPHRAGMATIC OR PHRENIC HERNIA.—Is the protrusion of a portion of the intestine into the Thoracic Cavity which is due to a rupture of some part of the Diaphragm, for neither from personal experience nor from any records can I discover the occurrence of it through dilatation of the natural openings. The case devolves itself therefore into one of Rupture of this structure, with subsequent insinuation of a portion of intestine. Mr. Williams in his work on the Principles and Practice of veterinary medicine states that he is of opinion that the majority of cases on record, of this lesion are due to post-mortem consequences; that they do however occur prior to death I have proved by two cases which have been brought under my notice lately, and on both of which cases, the cause of death was investigated immediately after its occurrence and before any gas had been eliminated in the intestines. The first case was one in which a pony had drunk very largely and afterwards on being turned loose in the Compound was seen to scamper about most vigorously. The second occurred on a horse

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admitted with Symptoms of severe Colic and was attributable to the violent and almost delirious way in which he threw himself down.

In both these instances in addition to the Symptoms of violent abdominal pain, respiration was hurried and labored, accompanied by heaving at the flanks and ingesta was returned through the Nostrils. The quickly failing or "running down," pulse gave evidence of speedy death.

Ventral Hernia or the protrusion of intestine through any portion of the abdominal parietes, except through the umbilicus (when occurring in this situation it is termed rembilical). The most frequent causes are blows and kicks or the patient lying down on some hard substance. It will be remembered that when speaking of the method of picketing horses, stress was laid on the advisability of having stones with rings inserted in them instead of pegs for the purpose of fastening them. These pegs are very frequently the cause of this lesion. The Tumor varies very much in size; at times being only about an inch at its base whilst at others being as much as a foot. On this will very much depend what treatment we adopt—should strangulation of the intestine ensue, we must of course, relieve our patient or death will ensue.

Treatment—various methods have been adopted, in cases where the tumor is small, a Surcingle and Compress have been used; but I cannot say that in my experience I have found the plan to answer. Should the tumor be of large size, ligaturing or applying Clams to the skin have been successful; whilst again after gathering up the skin and returning the intestine, skewers have been inserted through the skin with very good effects. Of the value of these various modes of treatment I am unable to speak from experience, but the history of the following case will at once suggest an easy and effectual means of giving relief. A young waler remount was admitted to the Infirmary suffering from a very severe type of low fever, 5 days after her admission whilst visiting her in the morning, I discovered that a rupture of the abdominal parietes had taken place and that the intestines had protruded. She was much distressed and the febrile symptoms were greatly aggravated; after returning the intestine I applied a compress with a surcingle but on my return in the evening I found her so greatly distressed that I removed it, but then I discovered that my patient was suffering from Paralysis of the hind quarters which I attributed to some injury of the spine at the time when the Ventral Hernia occurred. Herethen were complications, severe febrile symptoms, Hernia and paralysis, I at once determined to treat the more urgent symptoms, viz: those arising from Paralysis and Fever and to leave the further treatment of the Tumor to such time as I might have successfully combated the other more dangerous ones. In this I succeeded after about a fortnight and then I directed my attention to the tumor. I allowed another week to elapse before casting the patient, fearing that the operation might induce Paralysis to return: at this time

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the tumor was about 12 inches in width and not wishing to cause sloughing of such an extent of skin, I determined to try a more simple remedy which I had seen described by Mr. Percivall in his work on Hippopathology. Having cast the patient I fired across the tumor, the lines being one inch apart and afterwards applied a strong cantharidine blister, great attention was subsequently paid to diet, gruel boiled, barley, and no grass were given, gradually the tumor subsided and the patient was enabled to march with the Battery 19 days after the operation. She is now at work and the tumor which is now very small interferes in no way with her usefulness. Here then we have an easy and effectual remedy.

But a few words more on that form of Ventral Hernia in which strangulation takes place. No time whatever must be lost, the operation is simple. The Horse being cast and placed on his back, the skin is carefully divided, the rupture in the Abdominal walls is sufficiently enlarged to allow of the return of the intestine, the lips of the wound of the Abdominal parietes are then brought together with Metallic Sutures and those of the Skin with the ordinary twisted or interrupted. In the majority of cases the patients do very well.

With umbilical Hernia we are but little concerned, it is a lesion which mostly occurs in young Stock and therefore is of paramount importance in Breeding Establishments, should our attention however ever be directed to a case of this nature, the above remarks on Ventral Hernia will be sufficient to guide us in our treatment.

We now however come to the consideration of that form of Hernia which to us in India is of great importance. I allude to those two forms known as Inguinal and Scrotal. From the number of Entire Horses in this country it is of frequent occurrence, and, as before stated, no stallion should ever be admitted into the Infirmary with symptous denoting abdominal pain, without our making ourselves fully aware of the existence or otherwise of this lesion. I fear that the following remarks would be unintelligible without a slight knowledge of the anatomy of the parts and therefore a short summary is given. The testicles formed as they are during fœtal life in the abdominal cavity, have in their passage to gain the Scrotum to pass through two openings, which are termed the Internal and External abdominal rings, these are formed by divisions in the abdominal muscles. In their course through these apertures the testicles take with them folds of the peritoneum termed the Tunica Vaginalis and Reflexa, and it is between these two coverings that the intestine in both inguinal and scrotal hernia is protruded. It will readily be understood that when intestines through which food has to pass are incarcerated either in the inguinal canal or scrotum, symptoms of most severe abdominal pain will be present; it therefore behoves us to most carefully examine every stallion that may come under our care with these symptoms, so as to detect early any protrusion of intestine in these parts.

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These lesions are frequently caused by excited peristaltic action induced by Colic and therefore they must be looked upon as owing their origin to, as well as producing cases of Colic. Injuries and over exertion are also very liable to produce Hernia of this description.

SYMPTOMS—those by which we are enabled to detect cases of this nature are, if the intestine is not strangulated, slight abdominal pain, which is more or less continuous, breathing accelerated, the patient seems to obtain relief by placing his hind legs on higher ground, suddenly the intestine may return and the pain will cease. As a rule however a second descent takes place and then the pain is greater as the hernia becomes distended. If not relieved, the intestine becomes strangulated and symptoms denoting speedy death soon supervene.

The pulse becomes thready, the membranes injected, and the patient is covered with cold sweats. Manipulation will greatly assist our diagnosis, altho' I must admit that at times it is most difficult to assert for certain whether a horse is thus affected or not. In Scrotal Hernia it is at times a matter of great difficulty to diagnose between the tumor and other diseases affecting the testicles. The swelling however yields to pressure and may be partially reducible. Mr. Percival[1] asserts that a diagnostic symptom is the self expansion of the swelling under the effort of coughing.

If having made up our minds that Hernia does exist, what steps should we take to reduce it? I have known cases in which simply raising the hind quartes has been effectual, but is this remedy permanant? No—If then we wish to make a lasting cure what course should we adopt? I strongly recommend that in all cases, castration by the covered operation, which will hereafter be described, should be performed. If this operation is not performed, descent of the intestine is constantly occurring and may end in strangulation. In cases of the latter nature when the hernia is irreducible we should proceed as follows. The Scrotum should be opened with great care so as not to wound the intestine, having thus exposed it, we should then direct our finger to the Abdominal rings and if we are convinced that reduction without their enlargement is impossible, we should not lose a moment to increase the opening with the Bistoury Caché, taking care that the opening we make is no larger than is absolutely necessary. Having returned the intestine, we next proceed to castrate our patient by the covered operation which is done by including in the Clams the vaginal coverings, between which, it may be remembered I pointed out, the intestine always descends. The operation of enlarging the abdominal rings is one that has been successfully performed, altho' I regret to say not in my hands, as a reappearance of the intestine has always followed and from cases on record it would appear that in many instances it does fail, still, as being the only means which we possess of relieving our patient, it is our duty to do so, remembering that time is precious, as mortification soon ensues if the operation is delayed. Sufficient has, I think

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been said to point out how necessary it is for us in all cases of Colic amongst Entire Horses to satisfy ourselves that this lesion has not taken place.

I cannot close this portion of the subject without a slight allusion to Peritonitis or inflammation of the serous lining of the abdominal cavity and its sequel Ascites. The former being due in some cases, as will be shewn when enumerating the causes which induce its occurrence, to what may be termed bad stable management, whilst in other instances it supervenes in an attempt to relieve our patient of strangulated Scrotal Hernia, in fact it may arise in any case when Castration has been performed.

CAUSES. Exposure to cold when heated especially in winter months if horses are left unattended to on their return to stables. Surgical operations such as castration and reduction of strangulated hernia either Ventral Inguinal, or Scrotal. It has also been known to arise from overstraining of the body in continued or violent acts of galloping and jumping.

SYMPTOMS are not those of Colic, they are more indicative of dull excessive pain which is continuous. The Bowels are costive, the pulse hard and wiry whilst the breathing is painful, especially in inspiration and is mainly affected by the ribs, the abdominal muscles sharing but little. Prostration soon follows and death results.

TREATMENT, of this we can say but little. Cathartics should be avoided as it must be our aim not to increase in any way the peristaltic action of the Bowels. Large doses of opium in combination with stimulants to keep up the failing strength together with hot fermentation to the abdomen are plainly indicated.

With ascites, or dropsy of the abdomen, we are but little interested, except as far as that it occasionally follows Peritonitis. It frequently is also induced by innutritious provender. Diseases of the liver and heart will also give rise to it: any disease in short which may bring about a debilitated condition of the Body will be a predisposing cause.

The symptoms are enlargement of the abdomen which when percussed emits a dull sound. The sheath and leg are also œdematous and when the fluid increases the breathing becomes thoracic.

The treatment will greatly depend on the cause. Should it have arisen from improper food, the substitution of good food with occasional mild aperients and a course of mineral tonics will tend to bring about resolution. When due to either disease of the heart or liver we must of course endeavour to combat these organic diseases; but in most cases treatment will be a matter of difficulty. Should it be the result of Peritonitis a careful course of Absorbents followed by Tonics is indicated and in accomplishing this I know of no more useful agent than Ferri

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Iodidi in drachm doses. The operation of tapping a orparacentesis abdominis will afford temporary but not permanent relief.

We next come to the diseases affecting the liver, which to us in India is of paramount importance, owing to the large numbers of walers now imported, which, during their acclimatization, suffer greatly from diseases of this nature. Three causes mainly, are in operation to produce these effects viz: diet of an overstimulating nature, climatic influence, and want of exercise. As a rule our waler remounts are generally detained in the depôts for the space of one year, even should they have remained in the depôts for one hot season, they cannot be said to be thoroughly acclimatized. It behoves us therefore to be very careful in the management of these young horses when first joining. It, I think will be generally admitted that when they reach their Batteries, which is generally close on the hot wheather, that the administration of 5 seers of grain is excessive. They have not been accustomed to this amount and as their work must be but very small during this season of the year, it will be readily understood that we give them a greater quantity of nitrogenous and saccharine matter than is required for the repair of the various tissues. Much of this excess is fortunately not assimilated and is got rid of by the fœces, but at times much more is taken into the Blood than can be converted into tissue, or pass through the ordinary process of oxydation, preparatory to elimination. The result is that the excess of food is attempted to be thrown out in an imperfectly oxydised form by the kidneys, lungs &c. or is accumulated in the system. More work is forced on the liver than it can readily perform, and functional derangement of the organ ultimately ensues. In this manner congestion of the liver arises, which if not checked will produce structural changes of a dangerous nature. The occurrence of these abnormal changes is more likely to take place in horses, like the Waler Remounts, whose bodies are fully developed, but excessive feeding will at all ages bring them about. In speaking as I have done, let it not be understood that I consider that the actual bulk should be diminished, by no means let this be done; the Waler is a horse which has, as is commonly described, "a large barrel" and he requires a large amount of material to fill his stomach, let therefore bran be substituted for a portion of the grain, and if grass is at all scarce I would advise good oat or barley straw to be chopped up and substituted for a portion of the grain. Lucerne chopped with it, will prove a most useful corrective. I feel morally certain that the cause of many of our Waler Remounts being "ne'er do wells" after joining the Batteries, is simply owing to the fact that they do not get sufficient food to fill their stomachs. This will not be done by corn but by grass and other bulky substances.

Climate has an undoubted influence over these diseases. It may be said. "Yes, but over this we have no control. To this I would reply that although we certainly have but few means of reducing the temperature, still, that by careful feeding and proper exercise in the hot weather, we may greatly assist in mitigating the evils arising

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therefrom. A high temperature favors certain functional derangements of the liver, congestion and inflammation are more likely to occur in tropical than in temperate climates. The diet, as has before been said, which is suitable to cold seasons, will produce hepatic derangement in hot ones. The results of a heated atmosphere are no doubt due in part to the rarefaction of the air and corresponding diminution in the supply of Oxygen to the system, the hotter the air, the less will be the amount of this gas in a given volume inhaled by the lungs. This leads me to the consideration of the third cause inducing hepatic diseases, viz: want of exercise; for then I shall be able to demonstrate how a deficient supply of Oxygen affects the liver. Insufficient exercise in the open air will be certain to derange this organ, by the term "insufficient" I would not be understood to mean "excessive" but would refer my readers to the remarks made when speaking of exercise, for I am not an advocate for excessive or fast work during the summer months: a want, however, of regular exercise in the open air leads to hepatic derangement in two ways, 1st by causing a deficient supply of oxygen to the system, as a result of which the oxidizing process which goes on in the liver is imperfectly performed and there is a tendency to an accumulation of fat and of imperfectly oxidized products of disentegrated albumen. Oxygen is so to speak the antidote necessary for the lithic acid, &c., produced by imperfectly oxidised albumen.

Derangement from want of exercise is secondly due to the fact that thereby the Circulation of Blood in the liver is retarded. Respiratory movements greatly assist the passage of the vital fluid through this organ and in those horses not regularly exercised this auxiliary force is lessened, blood stagnates in the gland and the functions of the organ are deranged; these results being all the more likely to arise, if the liver be at the same time overstimulated by errors of diet.

The space at my disposal only permits me to give a brief sketch of the diseases most frequently met with and their treatment. The prevailing diseases, are, Bilious Fever Chronic Congestion and Inflammation of the gland and Jaundice, all of which can be recognized by the yellow color of the mucous membranes.

BILIOUS FEVER; in this disease we have a great amount of Constitutional disturbance, the pulse is quickened, respiration is increased; in some cases the appetite is totally lost, the patient is very dull, temperature of the skin is high and in one case the thermometer introduced into the Rectum reached 112° F. In addition to these symptoms we have in Bilious Fever, as also in other hepatic diseases, abdominal pain, high colored urine constipation, the fœces generally being offensive, and much coated with mucus, and as before stated the Conjunctiva &c. will be yellow.

The treatment which I have found most effectual in these cases of Hepatic disease in this Country are, 1st a thorough change of diet, in fact more benefit is to be derived from a carefully regulated diet than from

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medicine. Give no stimulating food—Linseed—Bran, and Lucerne seem particularly adapted for these cases, allow plenty of fresh air, for we have seen that Oxygen is necessary for the proper performance of the functions of this organ—mild aperients should then be given and I have derived great benefit from small doses of aloes followed by salines such as Sulph, of Magnesia in 4 oz. doses. Alkalines from their capability of promoting oxidation will assist us greatly. Water should constantly be kept before the patient, in which either Potas: Nit: or Ammon: Hydrochlor: are dissolved. Should the patient be in low condition after he becomes convalescent, the use of Tonics would seem to be indicated, but they must be carefully given, for they are apt to disagree in cases of functional derangement of the liver—the vegetable tonics such as gentian, chiretta, and cascarilla are preferable to any others, although we may at times give Ferri Sulph: in small doses carefully watching its effects.

It now only remains for me to allude cursorily to the diseases of the kidneys which may be said to have their origin in faulty stable management, or in excess of food, or that may be caused by the food possessing some property which so excites these organs as to bring about functional and even structural derangement. It has already been pointed out that defective grooming or want of exercise by not permitting the skin and lungs to perform their fair share of work will impose such an extra strain on the kidneys that they become deranged, for the more watery vapour that is exhaled by the lungs and skin, the less will have to be secreted by the Kidneys. Food rich in nitrogenous principles excite them, if given in large quantities, whilst we know that such articles as kiln-dried oats, mow-burnt hay, will induce Polyuria. Let us for a moment glance at a few of the more common diseases met with in this country so as better to be able to explain the effects of food on the kidney.

POLYURIA OR DIABETES INSIPIDUS. By which is understood profuse staling, is one in which besides an excessive discharge of urine, we have great thirst. This disease if not relieved will end in languor and debility. The causes are usually to be traced to food and in this country unparched Barley affected with Blue mould will produce it. I have also seen polyuria when horses are admitted into the Infirmary suffering from Indigestion. It is also a frequent precursor of Glanders and Farcy and is then due either to faulty assimilation or rapid tissue metamorphosis, owing to the glanderous poison in the blood.

The symptoms have almost sufficiently been described above, to enable us to recognize a case, but I may add that the urine is clear and limpid and possesses a specific gravity very little above that of water; another form of diabetes exists which is termed *diabetes mellitus* from the fact of the urine containing sugar. I have however never seen this form in herbivora.

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The treatment must consist of a thorough change of food; if the horse is being fed on Gram, then give parched Barley and *vice versa*, increase the quantity of bran, in fact for the first few days bran mashes alone will be required, and during this time mild aperients should be administered; should the symptoms not disappear then we must give Ferri Iodidi 1 dr. daily.

Hœmaturia; by this I wish to denote those cases in which horses are presented to us with "Blood colored urine" due to some overstimulating food and not those cases in which we have true hæmorrhage from any part of the urinary system caused by structural derangement such as cancers or melanosis or renal calculi. In this form of disease which I am now describing, if the urine be tested, no blood will be found and it has been satisfactorily proved that only the coloring matter escapes from the Red Corpuscles. The term therefore Hæmaturia would seem to be a misnomer.

The causes are undoubtedly overfeeding and want of exercise, bringing about a hypernitrogenous condition of the blood. The symptoms are entirely at first confined to the color of the urine, but if unrelieved, constitutional symptoms speedily present themselves, our patient soon shews signs of great debility and constantly breaks out into profuse sweats, the urine generally at first red becomes dark brown and death will ensue.

The treatment when we take into consideration the causes which have produced the disease and the condition of the Blood which exists, will naturally consist, first, in lowering the diet and the administration of tonics. Should the disease however prove of any duration we shall have again to give more nutritive food owing to the debility which ensues, taking care that it be of easy digestibility; we may have even to administer stimulants to assist nature, and tonics may ultimately have to be given.

I cannot close the present portion of this subject without alluding to another form of disease termed Oxaluria, in which we find a large proportion of the oxalates of lime in the urine, for again, this disease is produced by irregularity in feeding and also by food excessively rich in Saccharine matters. It may also arise from impaired digestion due to any cause. Oxalic Acid is always present in the urine, but in such trifling quantities as to be unappreciable, should however digestion be interfered with, food is improperly assimilated and oxaluria frequently results.

SYMPTOMS. In this disease one of the main points to lead us to be able to assert that oxalate of lime is present in the urine will be its examination. It is usually scanty and pale in color. If allowed to stand for some little time a sediment will be thrown down, which on being Microscopically examined will be found to consist of crystals which are usually Octohedral. This will, however, be accompanied by

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a regular train of symptoms, the most prominent of which are a capricious appetite, flatulence arising from disordered digestion, loss of flesh, unhealthy appearance of the skin, the animal being hide-bound, he will urinate frequently and in small quantities—the bowels are usually constipated.

Treatment will consist primarily in attending to the digestive organs and, as before, constipation was stated to be generally present, a dose of aperient medicine should be given. Food should be carefully selected and any article containing much saccharine matter should be withheld. The water should also be carefully examined, and, if containing large quantities of lime, its continuance will completely frustrate our best efforts at treatment. The most effectual mode of combating this disease is by the administration of mineral acids—the nitric—muriatic acid, in combination with Tinct Gentian: will generally prove successful—but remembering that the disease owes its origin to imperfect metamorphosis of articles of food through improper oxidation, we can readily understand that regular exercise in pure air is of primary importance.

I have now brought the subject of the consideration of the various diseases, arising from faulty digestion or bad stable-management to a close—many others there are—which might have been studied, but I feel that I have already exceded the limits of the present paper—if however I have done so, my excuse must be my wish to lay before its readers the great necessity for careful attention to diet and other subjects herein treated on—further, it was my wish to make the foregoing pages useful, and, at the same time, to more deeply impress the results of indigestion on their minds, I considered it necessary to lay before them, a short description of the diseases most commonly met with as results of improper management and, having done so, can we, I ask, feel too impressed with the fact, that unless we carefully study the feeding of our troop horses in India, and strenuously supervise everything which is likely to impede digestion—can we, I say, but feel that diseases of the various organs are likely to follow.

In conclusion, I would refer to the various works which have so materially assisted me in my investigations and to which I am indebted for many extracts. They are Fleming's Veterinary Science and Police—Parke's Hygiene. Kirke's handbook of Physiology—Williams' Principles and Practice of Veterinary Medicine and Surgery—Harley's Urine and its derangement—Murchison's functional derangement of the liver. Hunting on food and work, and Proctor on the Hygiene of air and water.

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IV.

A STREAK OF THE AFGHAN WAR.

BY

CAPTAIN R. ELIAS 59TH REGT.

LIEUT. GENERAL SIR D. STEWART'S MARCH FROM KANDAHAR TO GHAZNI, WITH ACTIONS OF AHMED KHEL AND URZU.

In the spring of 1880, when the snow had disappeared from the roads and plains between Kandahar and Ghazni it was decided that the time had arrived to make the long talked of advance on the latter place, in order to convince the Afghans of the '*fortiter in re*' that lies hidden behind our '*suaviter in modo*' principles of warfare, and to give them unmistakeable proof that, although our skirmishing line is in a great measure composed of silver, we possess reliable supports and reserves of lead and steel in the background.

The "Ghazni Field Force" was composed as follows:—

Lieut.-General Sir Donald Stewart K.C.B. Commanding.

1ST INFANTRY BRIGADE.

Brigadier General Barter Commanding.
60th Rifles.
15th Sikhs.
25th Punjab N.I.

2ND INFANTRY BRIGADE.

Brigadier General Hughes, Commanding.
59th Regiment.
3rd Goorkhas.
2nd Sikhs.

CAVALRY BRIGADE.

Brigadier General Palliser, C. B. Commanding.
1st Punjab Cavalry ("with" 1st Brigade).
2nd Punjab Cavalry ("with" 2nd Brigade).
19th Bengal Lancers ("with" Head Quarters).
19th Punjab N. I. ("with" Head Quarters).

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ARTILLERY.

Colonel Johnson, R. H. A. Commanding.
A/B. R. H. A. (" with" Head Quarters).
G/4 R. A. (" with" 2nd Brigade).
6/11 R. A. (Heavy Battery) (" with" 2nd Brigade).
11/11 R. A. Mountain Battery (" with" 1st Brigade).

No. 4 Company Sappers and Miners.
„ 10 „ do. do.
Engineer Field Park.

Ordnance Department, Transport Department, Survey Department, Commissariat Department, Section A. Section B. Field Hospital.

Total number of fighting men (including Artillery) in round numbers, 7,000.

The 1st Brigade left Kandahar on the 29th March, moving by the left bank of the Turnak. On the right bank marched General Stewart with Head Quarters, who left Kandahar on the 30th March, and the 2nd Brigade, which left Kandahar on the 31st March. On the 6th and 7th April, Head Quarters and the 2nd Brigade, respectively, reached Khelat-i-Ghilzai, and were joined by 2 Companies 59th Regiment, 2 guns G/4 R. A., and 2 guns 11/11 Mountain Battery, these troops having been on detachment there during the winter.

A halt of two days was made and some additional supplies and transport animals taken on. The latter consisted chiefly of camels, and considerable difficulty was experienced in obtaining a sufficient number for our force. Fortunately the season and weather were favorable and we lost comparatively few. To give an idea, here is a statement of the total number of transport animals belonging to the 2nd Brigade on the 24th April. The total number of camels at starting was 1804; there had therefore been a loss of 207 camels, or 11·47 per cent.

1597 Camels.
786 Mules.
114 Ponies.
460 Donkeys.
120 Bullocks.

The losses among the other animals were so small as to be scarcely worth mentioning: 1 mule, 2 ponies &c. Once more showing the miserable inferiority of camel transport.

On the 8th and 9th April, the march was continued from Khelat-i-Ghilzai. To give a detailed account of each day's stage would be tedious and uninteresting. The halting places on the right bank were nearly all the same as those encamped at by Keane's force in 1838 and described in the narrative of Major Hough, Deputy Judoge Advocate with that force. They are as follows:—From Kandahar to Momau—Robat—Khel-i-Akhund—Shahr-i-Safr—Tirandaz—Jeldak—Pul-i-Sang

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—Khelat-i-Ghilzai—Sar-i-Asp—Naurak—Tazi—Shahjui—Chashma-i-Panjak—Ghojan—Mukar—Karez-i-Oba—Jamrud—Mashaki—Ahmed Khel—Nani to Ghazni (2 marches). Total distance about 230 miles. These were the halting places of the Head Quarters and 2nd Brigade. The 1st Brigade followed a parallel line on the other side of the river, until reaching Jamrud where the whole division concentrated and afterwards moved on together.

In travelling northward from Kandahar, a considerable change is noticeable in the character of climate, country, and people all along the road. The hills look as bare and as barren as ever, but the strip of valley, sometimes narrow enough, sometimes opening out to a generous breadth on each side of the river becomes gradually more and more fertile, better cultivated and more thickly populated as the neighbourhood of Ghazni is reached. The people are finer, and they all understand Persian, which was to a certain extent an advantage, the state of the case on our side being that hardly any of us know Pashtoo, a few know Persian, and most of us are innocent of any knowledge of either. The villages are larger and better built, still of mud, but the cottages and forts are better finished, so that at a little distance, the latter especially, look as if they were of stone. The number of forts is surprising—each village, and they are often only a few hundred yards apart, has its fort, sometimes two, and one cannot help being forcibly reminded of the likeness to the state of things existing not so very long ago on the English and Scottish border as portrayed in the "Lay of the last minstrel" and other works of Scott. It is noteworthy, however, that, notwithstanding their frequent feuds and fights, very few maimed individuals are seen about, from which it would appear that either the fights are not so frequent and serious as they are said to be, or that short work is made with the wounded. At the present time of year, the crops are coming on and all looks peaceable enough in and around the villages, and we have remarked with satisfaction the absence of the privateering Ghazi, so unpleasantly common in Kandahar. Foraging parties have once or twice been fired at, and, on the morning of the 16th April, soon after leaving our camping ground at Mukar, Lieutenant Elverson, Transport officer, 2nd Brigade, who was coming up in rear of the column with some animals loaded with grain, escorted by a party of Goorkhas and 2nd Punjab Cavalry, had halted by the margin of a peacefully rippling brook, when all of a sudden a very lively and continuous, but badly aimed, fire was opened on the party from some caves in the side of a neighbouring hill on the left of the road; as it was impossible to reply to it, or to attack the natives in their hill, the only plan was to move on with as much dignity as might be inclining perhaps a trifle to the right. Strange to say no one was hit, but a bullet found its billet in one of Mr. Elverson's saddle bags. Three incautious Afghans, having ventured on to the road with arms in their hands were made prisoners and brought into camp. On the same day large bodies of the enemy were seen by the cavalry scouts on the right. For some days the dust

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had been seen, of a large body of troops moving about 15 miles off, on our right, and parallel to our line of march—exactly as they did in 1838—and it was pretty well known that they had been marching up all the way from near Kandahar, increasing their strength on the way, with the intention of opposing our advance when a convenient time and place should be found.

On the 17th April, the whole division concentrated at Jamrud. In this part of the country the valley is broad and thickly populated, and many of the villages are inhabited by our allies, the Hazaras; these, taking advantage of our presence, and of the fact that nearly all the Afghan villages along the line had been deserted, looted everything that was left and set fire to the buildings. On the whole, these friends were of little service to us—rather the reverse—much grain and bhoosa which would have fallen into our hands, and of which we were much in need, was appropriated by them. In physique they are inferior to the Afghans. They have the Mongol cast of countenance, and but little hair on their faces. When (or if) we leave the country their fate, it is to be feared, will not be an enviable one. On the march to Jamrud a small party of the enemy, chiefly cavalry, hung about our rear and right flank, keeping however at a respectful distance.

On the 18th we advanced to Mashaki by a sandy road, broken by nullas and watercourses. The Hazaras kept very close to us and on each side of the road were seen many Afghan villages burning. The Hazaras had set them on fire. In the afternoon, after arriving in camp, a reconnoitring party went out, was fired at, and reported the enemy in force about 3 miles "ahead" in the direction of our intended march next day.

The morning of the 19th April was close and sultry. We marched at 4.30. expecting that now at last we should meet the enemy; and we were not disappointed. The line of march was over a broad plain, rough and stony, and crossed at about 3 miles beyond Mashaki by a line of low sandy hills, where the Afghans had been seen the evening before. This line was passed without opposition and without even seeing an Afghan; but when we had advanced about 6 miles further, to just about the spot where we had intended to encamp, the crests of another and higher range of hills in our front, and to the left of our road, were seen to be covered by a large Afghan force of horse and foot. Very quiet and determined they looked on the tops of their hills, and it was impossible to tell how many more might be on the reverse slopes, in rear of those we could see. Their main body, chiefly composed of men on foot, was on a hill to our left front, and a large party, many of which were horsemen, was moving slowly round along the crests to a position rather lower down, and directly on the left of our advance; these looked so uncommonly near that many were asking if they were really the enemy, and whether they might not be Hazaras. Standards, red, green, and white, were being carried about, and others were planted in the

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ground. Some saw the Mullas blessing the weapons of the Ghazis before sending them down to fight.

Two batteries, A/B. R. H. A. and G/4. R. A. were soon in position, the former on a hillock to the right of the road, the latter on rather lower ground to the left and a little in front of A/B. A steady and effective fire was immediately opened on the main gathering of the enemy (Hills A-A); first shot fired at 9 A.M. The infantry now came up and formed for attack on the left of the batteries, 59th on the left of G/4, line continued to the left by the 2nd Sikhs, then the 3rd Goorkhas; 19th Punjab N. I. in reserve. In forming up, a gap was left between G/4 and the right of the infantry line—this was filled by 1 company, 60th Rifles, and one company, 25th Punjab N. I., both part of the Lieutenant General's escort. Two squadrons, 2nd Punjab Cavalry, were on the right rear of A/B, R. H. A. and of the other squadron, one troop, as escort, was on the right flank, and one on the left, of the two batteries; the main body of the 19th Bengal Lancers formed up in rear of the left of the infantry line—2 troops had been sent forward to reconnoitre the enemy's right. 6/11, Heavy Battery, halted about 1000 yards in rear of the line and opposite the enemy's right. The Field Hospital was established in rear of the line and more to the centre was a hill, where the Lieutenant General and Head Quarters Staff took post intrenching tools sent back, baggage halted in rear; 1st Brigade about 3 miles in rear. Such, as nearly as may be, was the position when the action of Ahmed Khel was begun. The Afghans were in a well chosen position, and, if they had been wise, they would have remained in it, and let us attack them after a hard pull up a steep hill; but, almost before the infantry line was formed, they began to come down on us on all sides. In the centre, crowds of Ghazis on foot came swarming over the crest and down the side of the high hill opposite the infantry and artillery, the latter continued firing and the infantry now also opened fire all along the line; but not a whit did the Ghazis waver. Very curious was the appearance they presented as they came in a steady crowd striding down the hill—fast enough, but not appearing to rush, their legs very wide apart (as I suppose they must be, running down a steep hill), most of them big men with long white robes flowing in the wind, right arms with swords and other weapons extended, and trying to guard their heads (against Martini-Henry bullets!) with shields. Any one with the semblance of a heart under his khaki jacket could not help feeling something like pity to see them thus advancing with their miserable weapons in the face of our guns and rifles; but their courage and numbers made them formidable. As they came on, at about 600 yards, the effect of our fire began to be seen in earnest, and, at 300 and 400 yards, the slaughter was terrific—as the smoke rolled away, the ground in front was seen to be simply strewed with prostrate Ghazis. Still they advanced with courage amounting to madness. Now supports and reserves were all in the fighting line, which was certainly rather too crowded: and the batteries A/B, and G/4 began to fire case, and a little later inverted Shrapnel. While this was going on in the centre, the

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enemy on the right and left had also advanced. On the right they came in masses of cavalry and infantry, making the most determined attempts to get round and attack us in rear; it was here that the 2nd Punjab Cavalry did good service by making repeated charges by troops, thus checking the advance, but they came in such numbers that it was impossible to drive them all back at once. On the left a similar turning movement was being attempted; here a party of the 19th Bengal Lancers, moving at a trot, came upon a large body of Ghazi cavalry galloping round the spur of a hill—this happened so unexpectedly that the Lancers were irresistibly and unavoidably thrown back, and both parties fighting hand to hand, came galloping in past the left of, and through, the Goorkhas, who formed company and rallying squares and creating no small confusion in the 19th Punjab N. I., the Field Hospital, and among the occupants of the Lieutenant General's hill; but the Ghazis, already without order or cohesion, were, by the Lancers, the fire of the Goorkhas, the 19th Punjab N. I., and of other corps near, who could bring any fire to bear upon them, dispersed and driven beyond our line. These three attacks were made almost simultaneously—that on the left began a little later than the others; a party of the enemy also, some cavalry, some on foot, had made a movement down the lower hill on our left rear, and opposite to where 6/11 R. A. had halted. They appeared to be meditating an attack on the baggage, but Major Tillard landed a few shells from the 40 pounders among them, when any design they may have had on the baggage, was speedily abandoned, and they were seen no more. And now came the critical moment, the turning point of the day. For three quarters of an hour, the Ghazis had been continually swarming on, right up to the muzzles of our guns and rifles. As soon as a knot of 6 or 7 men had been swept away by case shot, as frequently happened, or mown down by the rapid fire of the Martini-Henry their places were at once filled by others—their numbers seemed endless; and on the right considerable bodies were actually inside our line—for this reason it was necessary to throw back that flank. The two batteries, the two escort companies (of 60th Rifles and 25th Punjab N. I.), and the 59th Regiment all retired, (for about 200 yards on the extreme right, towards the centre, somewhat less); firing was kept up on the enemy already in, and trying to get into the line, and they were thus kept on the right side of our guns and rifles. As soon as this was the case the guns again came into action, 2 guns G/4 going to the right, and 4 to the left, the infantry halted, fronted, and again opened fire nearly in the original direction. The line at this time was in shape very nearly the arc of a circle. After a few minutes more firing, it was plain that the rush of the Ghazis was broken—crowds continued to come on, but not with the same vigour as before, then many were seen edging off to the right and left, some deliberately retreating, the entire attack seemed to open out and give away, the military atmosphere was clearing—a few minutes later the whole were in full retreat, and the day was ours. The fighting had lasted a little more than an hour. Most of the fugitives moved off in the direction of the river and the Shilghur hills beyond, *i. e.* East-

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ward; but a large body collected on a hill more to the north, nearly a mile from us. As it was not quite certain whether they might not gather again, a general advance was made to some rising ground about 500 yards in front—but they had had enough; after a few well directed shells, those on the hill also dispersed. The greater part of the cavalry, joined by the 1st Punjab Cavalry, which had just come up in time from the 1st Brigade, pursued the fugitives for about 3 miles; our horsemen were then recalled: they killed many and would have accounted for many more, could the pursuit have been continued. A halt of about an hour's duration was made on the ground, and all were glad of a rest. During this time it was necessary to keep a sharp eye on the enemy's wounded and apparently dead, in order to guard against such mischances as the following:—A soldier of the 59th Regiment walked up to an Afghan, wounded and lying on the ground: suddenly a sword sharp as a razor flashed from under the folds of the prostrate man's dress and inflicted such a terrible wound just below the 59th man's knee that his leg has since had to be amputated. There were several cases of wounded men doing their utmost to injure anyone who approached them—fortunately they were not generally successful.

It is difficult to estimate at all accurately, the numbers of the enemy; but altogether there must have been from 12,000 to 15,000 but many of these never came down from the hills. The real attack, the rush of Ghazis, was made by 3,000 or 4,000, of whom about 600 were mounted. Their loss must have been at least 2000 killed and wounded—probably more. Our numbers actually fighting, were, approximately 1800 infantry, 700 cavalry (not including the 1st Punjab Cavalry, which joined afterwards) 12 Horse Artillery and Field Guns, and the Heavy battery consisting of 2-40 pounders, and 2-6.3 in. howitzers. Our loss, 17 killed, 126 wounded. Most of the Afghans were armed with swords and shields—there were among them a few Snider rifles, some had bayonets on sticks, and about one third were fitted out with matchlocks, and flint and steel implements with short thin stocks, very much bent and generally inlaid with ivory, such as may be seen on the walls of any old armoury at home, where they repose in the character of antique curiosities: when fire is applied to the touch-hole, or the trigger is pulled, they sometimes go off—sometimes they do not. The Hazaras, to the number of about 2000, remained spectators of the fight, but did not join in it—they joined however in the pursuit. During the hottest part of the fight, just when the right was being thrown back, a Color Sergeant of the 60th Rifles, at some distance in front of the line, was wounded and unable to move, dozens of Ghazis were making for the spot to despatch him, when 2nd Lieut. Twynam 59th Regiment gallantly ran out to his assistance; he got close up to him, was cut at by a Ghazi, parried the cut and ran another Ghazi through the body, but the soldier was hacked to pieces in a minute, and Mr. Twynam only just got back to the line in time to save himself from a similar fate. A like bold attempt was made by Major Frampton 59th Regiment, in the case of another wounded soldier; but it was impossible to

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rescue any one who was down; the Ghazis immediately swarmed round him like hounds breaking into a fox,

The Afghan Commanders were Shir Jan, Taraki; and Mahomed Aslam, Tokhi. It is said that a son of Mushki Alam was present at the action. The Chief tribes concerned in it were Tarakis Andaris, Tokhis, and Súleiman Khels.

At midday the whole division, now together, commenced a general advance in line of columns over very rough ground. No more was seen of the enemy, except those unfortunates who had not been able to get far away from the field. The advance was continued to Nani, a village about 7 miles beyond Ahmed Khel, where we encamped for the night. Soon after pitching the tents a party of armed men, apparently Afghans, was seen approaching the camp; the alarm was sounded, all turned out; when lo! it was no enemy, but some of our old friends the Hazaras again; with many smiles and salaams they came in, and reposed for the night in the neighbourhood of the 59th guard tent. The whole force broke up from Nani early next morning and marched towards Ghazni, the road leading through a broad fertile valley covered with fine orchards and fortified villages. We encamped on a plain 6 miles short of Ghazni, the fortress being visible under the hills in the distance. A strong party of cavalry was sent on and found the place undefended. On the 21st, marched to Ghazni and encamped just outside. But few people showed themselves, the shops (such as they are) were shut, and supplies were scarce. Ghazni is well placed in the country to form a rallying point for malcontents and other gatherings, but it lies at the foot of the hills, is commanded by the neighbouring heights, and, from a fortification point of view, is not specially formidable. A large quantity of powder was found there, also a battery of 6 small brass guns made at Sherpur, and 4 guns of larger calibre. Two of the latter were brought away, the remainder left there.

On the 22nd, it was reported that a large body of the enemy were gathered in the villages of Urzu and Shalez, 7 miles South West of Ghazni; it was determined to attack them next day. Moved out from the camp therefore under the command of Brigadier General Palliser C.B. at 3 A.M. on the morning of the 23rd, the whole of the 1st Brigade, reinforced by the 2nd Sikhs and 2nd Panjab Cavalry, with A/B R.H.A. and 11/11 mountain battery, and 1st Panjab Cavalry. Followed in reserve, an hour later, under Brigadier General Hughes, the 59th Regiment, 3rd Goorkhas, 4 companies 19th Punjab N. I., G/4 R.A., and 19th Bengal Lancers. All carried with them one day's cooked rations. Remained for protection of camp, 6/11 Heavy battery, and piquets and guards of all corps. The reserve moved about one mile out of camp and halted so as to be ready in case of need, while the troops under General Palliser marched on to attack and surprise the villages. The advance was over stony, uneven ground, and a ridge of hills immediately in front hid the villages from view until within 2 miles of

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them. On reaching the crest of this ridge, General Palliser saw that the surprise was complete enough, and great was the excitement and loud the inspiring tones of the tom-toms when our early visit and its nature became apparent. The early bird is pretty sure of its Afghan worm, as the latter never has any piquets out. It was also seen, however, that the mud walls were very thick, that a large force was gathered within, and the ground just in front of them looked, from our position, low, broken, marshy, and uninviting to advance over. The two villages were nearly ½ a mile apart; there was a good deal of cultivation around but no large trees, so that the villages stood very clearly exposed to view from the ridge of hills above mentioned. The guns were at once pushed forward and began to shell the places, but the occupants declined to be dislodged. The bombardment was kept up for an hour, but the outer walls and those of the houses were so thick that the light 9-pounder shells had little effect. "J'y suis, et j'y reste" seemed to be the policy determined on, and was being very obstinately carried out. An advance of cavalry and infantry was productive of little result, and it became clear that, with the numbers at General Palliser's disposal, nothing short of storming the places would drive the enemy out. Such a proceeding, although pretty certain of success, must inevitably have cost many lives, a sacrifice which the occasion did not demand, and which our small force could ill afford. A message was therefore sent back to the Lieutenant-General (with the reserve) explaining the state of things, and the 3rd Goorkhas, and a half battalion 59th, were sent forward as a reinforcement. These were soon afterwards followed (9. 30 A.M.) by the Lieutenant-General and the whole of the troops in reserve. By the time the 2nd Brigade (i.e. reserve) had reached the ridge of hills, the enemy had received some reinforcements from the neighbouring villages; and many, some cavalry, but mostly infantry, were now outside in rear of the open space between the two villages, but well out of range. Twice they formed up and made a feint to advance, but were careful not to commit themselves to any rash action—behaved very differently to the Ghazis at Ahmed Khel. At 11 A.M. an advance was made by a long line formed of the combined Brigades. The artillery at once commenced shelling the villages and the party opposite the interval, the latter, still in no way rash, retiring slowly as soon as our advance began. The infantry opened fire as soon as they got within range. There was not much to fire at, for the occupants of the villages kept as much as possible out of sight, and their friends in the field out of range. A feeble and ineffective reply to our fire was kept up, and the enemy appeared to have 2 guns, which were heard but not seen.* Steadily advancing, our long line reached the walls of the villages, our flanks overlapped and began to turn them; then, fearful of being surrounded and caught in a trap, all the Afghans rushed out and made off over the country in full retreat. At this time many were killed; their loss is said to have been about 400; ours, 2 men killed

* Probably only large jezails.

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UNITED SERVICE INSTITUTION OF INDIA.

NOTICE.

The Council having decided to present a Gold Medal for the best Essay on "Military Deductions to be drawn from the late Campaigns in Afghanistan" make known the conditions of competition.

1. The candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 Pages of the Size and Style of the Journal.
3. Essays must be received by the Secretary on or before the 1st May 1881.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto, written on the outside and the name of the candidate inside.
5. The Essays will be submitted for decision to referees chosen by the Council.
6. The name of the successful candidate will be made known at the Annual meeting and his Essay will be printed in the Journal.

By Order of Council,
A. D. ANDERSON, CAPT., R. A.,
Honorary Secretary.

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UNITED SERVICE INSTITUTION OF INDIA.

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Honorary Secretary.

SIMLA,
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JOURNAL

OF THE

UNITED SERVICE INSTITUTION OF INDIA.

SPECIAL NUMBER ON TRANSPORT.

Gold Medal Essay 1880.

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

BY

LIEUT. E. G. BARROW, B. S. C.
7th Native Infantry.
OFFG. D. A. Q. M. GENERAL.

"Frappez fort et frappez vite."

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ORIGINAL PAPERS.

I.

THE JOURNAL

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A TRANSPORT SERVICE FOR ASIATIC WARFARE.

By Lieut. E. G. Barrow, B. S. C.

7th Native Infantry. Offg. D. A. Q. M. Genl. Rawul Pindee Division.

Motto:—*Frappez fort et frappez vite.*

CHAPTER I.

The organization of an efficient Transport Service is of paramount importance to the army of India. The administrator who organizes transport will organize victory and the invariable success of our arms, for the primary cause of all our reverses has been want of transport and failure of supplies. In Asiatic warfare the main difficulty lies not in beating your enemy on the field of battle, but in feeding your army at the various points of the theatre of war. The army may safely be relied on to do its duty before the enemy, if only it can be brought face to face with him unexhausted by privations and fully provided with all necessary munitions of war. In training, in discipline, in armament, the army of India is immensely superior to any foe it is likely to meet, the result therefore of a campaign, more especially as regards duration and cost, will chiefly depend on the means provided to secure the physical efficiency of the soldier throughout that campaign. Victory will depend mainly on *supply* and to ensure *supply* should be the first aim, the most anxious care of an Indian commander. With an Asiatic foe rapidity of action is worth thousands of soldiers but rapidity is impossible where transport is wanting. The sudden blow paralyzes combinations and destroys coalitions. "*Frappez fort et frappez vite*" should be the guiding maxim of every Asiatic general, but that maxim it is impossible to adhere to unless we have prepared in peace the means of ensuring supply in war. *Supply* broadly speaking depends on—

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(1) The resources of the theatre of war.
(2) Whether the war be offensive or defensive.
(3) The length of the line of operations.
(4) The temper of the local populations.

Now as a rule in Asiatic warfare the circumstances under which the war is conducted are adverse to us from each and every point of view. The resources of the theatre are of the barest description, the war is an offensive one, the lines of communication are long and difficult, and and the inhabitants of the country are ill disposed. If therefore the army is to be regularly and thoroughly supplied with all necessaries, we shall have to rely mainly on the efficiency of our Transport Service. To trust to the army being able to feed itself in the theatre of war, would only be to court the gravest disaster.

The essential conditions of an efficient Transport Service are *good communications and a sound organization*, unless these conditions exist, the losses will be immense, the war rendered more costly and the operations retarded if not actually brought to a stand still. The enormous losses in camels, the deficiencies in food and clothing, the delays so often incurred during the late campaigns across the Indus were due above all to the wretched condition of our communications and to the lamentable want of preparation and organization in our Transport Service. Undoubtedly the rigours of the climate and the want of good water are accountable for the deaths of thousands of animals and hundreds of men, but still greater numbers probably died from the additional fatigues caused by the badness of the communications, and from the lack of systematic supervision, in other words from avoidable causes. Causes which we can control, and the evils entailed by which we can greatly modify.

The first great object must be to reduce as far as possible the number of pack animals required for a campaign, and this can only be done by improving our communications, by extending our railway system, and by carrying forward roads fit for wheeled traffic to the furthest possible limits. The next aim should be to give such an organization to our Transport Service as will secure the maximum degree of efficiency in all its branches and details at a minimum cost.

For any campaign beyond our frontiers we know exactly what would be the base of operations, and as far as the base at all events the communications should be so perfect, either by river, or rail, or road that not a pack animal of any kind would be required. It may appear that the question of communications is beyond the province of an essay on transport, but as the magnitude of transport operations depends to such a degree on the state of the communications it is impossible to avoid the question.

It is perfectly clear that the transport of supplies from immense distances is a necessity of warfare on a large scale, as restricted areas,

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except in every rich and densely populated countries, are incapable of supplying the varied wants of a large army; but transport from a distance by any power but steam must as far as possible be avoided. All other carrying power involves loss of time, money and animals. The enormous advantages that accrue from railways may be illustrated by the fact that one line of railway running twelve trains a day supplied the whole of the German armies round Paris. The gain to Germany in time, money, and animal life it is impossible to calculate. What will be the gain to India when on some future day, railways running two or three trains a day will be carrying supplies to our bases of operations at Kandahar and Jamrood? Contrast that gain with the losses and delays of 1878-79. Whatever may be the original cost and the deficits of early years, good communications are in the long run true economy. War or commerce will eventually repay all losses. Putting railways aside, the advantage in warfare of good carriage roads is incontestible as they enable us to make use of draught carriage, the superiority of which to pack may be ascribed to the following reasons:—

(1) Many more pack animals than draught are required for the conveyance of the same amount.

(2) The loss in pack animals is greater than in draught, partly because for the former the labour is greater, and partly because they obtain no relief from temporary halts on the march, which the latter do. Experience shows that in a campaign, the loss in pack animals is 50 per cent greater than in draught.

(3) With carts and wagons, time and labour are not lost each day in loading and unloading baggage.

All we have yet said points to the necessity for constructing railways and carriage roads to the furthest possible limits. It is the first great want, the most pressing need of an efficient Transport Service.

Beyond the base as a rule in Asiatic warfare pack carriage becomes a necessity. The question of a Transport Service must therefore be chiefly considered with reference to pack carriage. But that service must be organized in time of peace, every detail considered and ample instructions on every point drawn up. When war breaks out it is too late to elaborate schemes and issue instructions, and if no system is already prepared immense confusion and loss will result.

Food, clothing, ammunition, everything, may be ready in any quantities, but who is to take charge of it? How are the baggage animals and their owners to be supervised? How are the men to be clothed and the animals fed? Who is to tend them when sick? How are the various stores to be distributed to their ultimate recipients? A thousand such questions crop up and are settled in a hundred different ways. Young officers who hardly know a word of the language are

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placed in command of a long string of camels, an animal which they probably imagine has seven stomachs, and an unlimited supply of food and water in every one of them. The pay, feeding and clothing is left to intelligent gomastahs who suddenly discover that the invaded wilderness is a very rich country. Chaos reigns supreme. The baboos wax fat, but the gallant fellows in front are starved. Baggage animals die for lack of proper care, while the followers abscond for want of pay and clothes.

No! War waged on such principles must some day end in disaster. If we wish to avoid it we must systemize every detail beforehand. Better a bad system that none at all!

In considering the organization of a Transport Service, the first point is to enquire how in war the service beyond the base should be subdivided, in other words the channels through which the supplies at the base are to be distributed to the corps in front; the next to investigate the relation of transport to the other departments, and its general supervision and command. When we have decided the broad principles which should govern these points it will be time enough to examine details.

It will be needless to waste time and paper in arguments for and against the principles of organization followed below. They have been discussed over and over again till the subject is threadbare, and the experience of modern warfare as well as unanimity in the opinions of all great modern authorities tend to show that they, and they alone, are the principles which should guide us in the organization of all transport in the field. Backed by such experience, supported by such authority we have no hesitation in affirming that the only sound system on which to organize transport from the base onwards is as follows. Transport to be divided into three great divisions, viz:—

(1) General, — Commissariat,
(2) Departmental, — Ordnance, Medical,
(3) Regimental, — Engineers.

The first:—to carry supplies from the base to the advanced magazines, to be worked on the *stage system*, and to be throughout under the commandant of the line of communications. This General Transport would as a rule in extended operations be chiefly hired transport organized in sections under military officers.

The second:—to carry on supplies from the advanced magazines, which should be established two or three days march in rear, to the head quarters of divisions or brigades as the case might be. The medical branch of the Departmental Transport however has functions totally different. It is its place to convey all sick and wounded from the extreme front to the base. Field, rest, and base hospitals, all must

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depend on this branch for its transport. Departmental Transport should be under departmental supervision.

The third :—to carry all personal baggage and regimental equipment, necessary with the corps, and to fetch and distribute the supplies brought to divisional or brigade head quarters by the Departmental Transport. It should be under commanding officers of corps.

The General Transport must as we have said be worked by sections on the stage system. This system is in every way the most economical, as apart from advantages in feeding men and animals employed, and their medical supervision, the unremunerative weight carried is less, only a very small portion of the kits of drivers and 'personnel' of the train being carried each day. Each section of the train should be under a subaltern officer. Active young subalterns are quite capable of supervising a section, provided they know the language and have been trained in transport duties. These duties should only extend to such supervision both on the march and in camp. The officers themselves should have nothing whatever to do with the commissariat, but should be directly answerable to the commandant of the communications and his subordinates, who, to prevent questions of rank cropping up, should never be under the grade of captain.

The Commissariat lay claim to the control of transport throughout; but this is absurd. It has quite enough to do in providing and regulating the supplies for the army. It has no time to interfere in, such matters as payment, discipline, rationing, loading and inspecting. All that must be left to the transport officer. The Commissariat should not command the transport, it should only make use of it. Friction between the two branches of supply and transport can only arise from a misconception of their respective duties. That of the commissariat officer is to provide the supplies required, that of the transport officer to convey them. His duties extend to the discipline and efficiency of his section, and to the care of the stores entrusted to him. Pay, clothing, food, punishments, health of men and animals, harness and proper adjustment of loads, should give him enough to do and prevent him wasting time in squabbles with commissariat and combatant officers as to command and relative position. Superior officers of transport are not usually required along the line of communications, neither on the march nor in camp. If the operations are of so great a nature that several transport sections have to be worked along each stage, then considerable escorts will probably be required, and in that case the officer commanding the escort will be of sufficient rank to take command of the whole convoy whilst on the march, whereas in the presence of superior transport officers questions of command would arise. If the escorts are small it follows that the country must be tolerably quiet, and military considerations become subordinated to requirements of the transport. The senior transport officer with the convoy then naturally takes command while the subordinate combatant officer and the escort

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merely perform the duties of police. To ensure unity of action, with regularity and order on the march the rule should be enforced that the senior officer, transport or combatant—takes command of the convoy. It will generally be found that where military considerations are of the first importance the senior officer will be the officer in command of the escort, and at other times it will be only right and fair that the whole convoy should be under the command of the senior transport officer. In any case divided command must be avoided.

At the various halting places along the line of communications will be stationed the subordinates of the 'commandant of communications,'—officers of various grades according to the importance of the posts they occupy, but never under the rank of captain. It is to them that in camp the transport officers must look for orders. As the road is the link between the advanced magazines and the base, so the commandant of communications should be the link between the general commanding the army and the supply departments at the base. He is responsible for the communications, he knows what is most required at the front and at the various points along the line, he knows what escorts can be spared and where the line is most threatened. It is he then who can best control the safe conveyance of the stores sent forward, and decide when it may be necessary to divert the transport temporarily for any specific purpose such as the supply of flying columns. He and he alone must be the head of the General Transport of the army, and his subordinates must be the channel through which his orders are conveyed to the transport officers. The Departmental Transport of the army, or rather that portion of it which carries stores from the advanced magazines to the army, must as already stated be under its own departmental officers. Otherwise confusion will arise, for unless stores are handed over at the advanced magazine direct to the departments concerned they will inevitably get mixed, and delay in delivery will result, just when delay would be intolerable. Departmental supervision from the base to the advanced magazines is unnecessary as the question of issue is not involved, except at the various magazines *enroute*,* it is therefore an indifferent matter who conveys the stores as long as they are conveyed. But from the advanced magazines onwards precision and regularity in delivery become of the first importance. Stores indented for from the front and issued from the magazine, must be conveyed without fail direct to their destination. The economy of the stage system must be abondoned and departmental supervision must ensure exact delivery and proper distribution. The various sections of the train will still be commanded by transport officers, but they must be under the orders of the department to which they are attached. Lieutenant X, and his section of transport may be affiliated to the Commissariat or the Ordnance, whichever it is, he must carry the

* At such places Commissariat and Ordnance officers or subordinates would be stationed, who, with regard to the troops along the communications, would occupy the same relative positions as the departmental officers at the advanced magazine do, to the troops in front.

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stores for that department straight through from the magazine whence he has received them, to the point at which the departmental officer, to whom he is subject for orders, has directed him to deliver them.

As regards the medical portion of the departmental transport, the above theories do not apply. The greater portion of Medical Transport will be absorbed not in the carriage of supplies, but in the transport of sick and wounded from the field hospitals to the hospitals in rear. Such transport will be chiefly doolie transport, and as happily the stream of sick and wounded does not flow uninterruptedly to the rear, but by occasional spurts at uncertain intervals, it would be a waste of power to adopt the stage system for the transport of sick and wounded. Moreover when a convoy is carried straight through from end to end by the same bearers, the comfort and well-being of the sick is the better assured. Human lives are too valuable for the application of economical principles, and therefore *all* sick carriage should be under departmental supervision. The sick carriage of the army will consist of:—1st Regimental sick bearers at the disposal of regimental medical officers. 2nd Doolie bearer sections attached to field hospitals. 3rd The sections working between field hospitals and the nearest general hospital. 4th The sections transporting sick from the general to the base hospital. The whole except perhaps the regimental bearers must be considered as strictly under departmental supervision. Those in the second category would be under the orders of the medical officers in charge of field hospitals, those in the third under the P. M. O. of the force or the division, and those in the last category under the P. M. O. attached to the staff of the commandant of communications.

On the Departmental Transport required for the engineers it is needless to dilate. The ordinary stores for the department may be forwarded in the ordinary manner by the General Transport of the army, but everything of a technical nature such as pontoons, field telegraphs etc. must be entrusted to departmental supervision.

Regimental Transport comprises the transport necessary for the reserve ammunition in charge of corps, intrenching tools, camp equipage, baggage, two days' rations etc, and it must also be prepared to carry supplies from divisional or column head quarters to the regiment for distribution. It should be entirely under the supervision of the quartermaster or some other officer of the corps, whose place on the march should invariably be with it.

Regimental Transport accompanies the force on the march. It may at any time be in the presence of the enemy, it must therefore be highly organized. On the march order and regularity are of the utmost importance, while a judicious arrangement of the various fractions is no less essential to the comfort of the force. With this transport moving with the force, it will then be found that the presence of superior officers is desirable for the preservation of order, and to prevent the interests of the whole being sacrificed to the exigencies of individual corps. These

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superior officers should be termed Baggage Masters, they should be captains or field officers according to circumstances and should take their orders direct from the general or through his staff.

Let us now summarize the general features of the system on which the transport of the army would be conducted.

Regimental Transport: viz that moving with the force, conveying equipment and personal baggage, and carrying out the actual distribution of stores handed over by the several departments; to be under the command of quartermasters and subject to the supervision of specially appointed baggage masters.

Departmental Transport (Commissariat and Ordnance): viz that carrying stores from the advanced magazines to the departmental headquarters with the force, to be under transport officers but subject for orders to the department concerned.

Medical: to consist of doolie-bearer sections under transport officers, but dependent for orders on the medical department.

Engineers: to be entirely at the disposal of the engineers.

General Transport: viz that conveying stores of all descriptions from the base to the advanced magazines and to the various supply depôts en route. This portion of the transport would in extensive operations be chiefly hired, but would in any case be organized by sections on a military basis, and would work by stages. On the march the senior officer with the convoy would take command. The whole service however would be regulated and controlled by the commandant of communications, and his subordinates,—the staff officers of the various posts en route.

The commandant of communications should be either the officer commanding the troops along the line, or an officer of high rank in direct communication with him and specially selected for the purpose. The troops guarding the line would of course be moveable at will and interchangeable, therefore if transport officers were managed by the staff officers attached to these troops, the whole machinery of the transport would constantly be thrown out of gear. The staff officers regulating the traffic must be stationery, and their proper places are the various rest camps along the line. The Commissariat have nothing to do with this portion of the transport, and the authority of the commandant of communications *must be paramount*.

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CHAPTER II.

Let us now enquire how the existing system meets the exigencies of modern warfare, and of our military position in India, and also whether that system is applicable to the requirements of a transport service organized for employment in Asiatic warfare.

Our present peace organization consists in the maintenance by the Commissariat of what are called "movable columns." These columns are distributed throughout the country from Peshawur to Trichinopoly, while their strength varies in proportion to the strength of the different garrisons. In Bengal alone movable column carriage is maintained for

9 Batteries (54 guns).
6 Squadrons European Cavalry.
9 Regiments Native Cavalry.
9 „ British Infantry.
12 „ Native Infantry.

In short, sufficient for three divisions.

The aggregate number of animals maintained for this force amounts to

558 Elephants
4554 Camels.

Besides these animals and their attendants the following sick carriage is kept up.

18 Sirdars
108 Mates
3429 Doolie bearers.

In addition to the above establishments, regiments of native cavalry and of the Frontier Force maintain in peace a certain proportion of regimental carriage. But all this carriage, considerable as it is in the aggregate,—sufficient including Bombay and Madras for a couple of Army Corps,—is so widely dispersed as to render its concentration for any particular purpose almost impossible, and then only at a monstrous expense. Even when concentrated these movable columns for want of uniform and systematic organization are ill adapted to great operations, while it would be almost impossible to remodel them in accordance with the requirements of a transport service as sketched in the preceeding chapter. In short this movable column system is one which, on the outbreak of war must

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result in great delay, terrible confusion and comparative inefficiency. It answers neither for internal nor external warfare. For the one it is too cumbersome, for the other too scattered. Wherever troops are located we require a certain proportion of transport *instantly available* in case of internal disturbances, whereas at present it is only so available at certain stations, and there even only at the price of *inevitable* confusion. While for external warfare the carriage should be *concentrated* at certain convenient localities, yet under the present system it is widely dispersed. There can be no doubt that the system is ill-adapted to the necessities of the present day. Improved communications and altered strategical and political considerations have rendered unnecessary and unsuitable an organization which was devised when every station was as it were, the centre of a zone of operations; when our scattered forces were separated by dis-affected districts, and encompassed by hostile or doubtful feudatories, and when those forces for want of good roads were unable to move or concentrate without constantly maintaining close at hand a large amount of pack transport. But all this has been changed by modern science. Good roads, railways, telegraphs have enabled armies to concentrate wherever required almost without the aid of pack transport, and with a rapidity that fifty years ago would have been deemed incredible. To maintain great establishments throughout the country merely to facilitate concentration is now no longer necessary. Troops have no longer to march for weeks and months that an army may be massed on the banks of the Indus or the Sutledge, but are carried thither by the swifter and surer agency of steam.

Steam has effected a complete revolution in the military requirements of the Indian army. These numerous movable columns are no longer wanted, they only add to the immobility of the army. What we do want is an establishment that will be always readily and instantly available.

The elements of such an establishment would be a certain amount of regimental transport attached to every corps in the army, British or Native; a few completely organized transport depôts capable of considerable expansion, at certain points in advance of our railway system, such as Quetta, Candahar, Kohat, Pindee * and Peshawur or at great strategical and political centres such as Lucknow, Mhow, Secundrabad and Poonah; and finally a coolie corps for Assam.

The regimental transport would consist mainly of mules and ponies, and should be on such a footing, that troops could move on the very shortest notice to repress local disturbances. All a regiment requires in such circumstances is pack transport for cooking utensils, blankets, intrenching tools, and about 50 rounds per man for $\frac{2}{3}$ of strength. With that much transport troops can for a day or so be

* Written before the extension of the railway to Pindee.

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independent of other carriage, the men themselves can carry three days' rations, and tents, baggage, etc. can if necessary be sent on afterwards by means of carriage obtained from local sources. In the case of epidemics we have always warning sufficient to enable us to procure the requisite carriage. It is therefore unnecessary to maintain movable column establishments on sanitary grounds. The doolie bearers however of the movable column establishments, should be retained at each station, as not only may they be required in case of epidemics but also in the event of local disturbances. The arguments in favor of the abolition or reduction of movable columns do not apply to the doolie bearers. In the hot weather they can be utilized as punkah pullers and when required for active service, they can easily be transported by rail to the scene of action.

With the animal portion of the movable columns it is however far different. It cannot be economically utilized, it is no longer indispensable to the mobility of troops, and its conveyance by rail to the frontier would be a very serious matter. So far then the local establishments should be broken up, and all animal transport not regimental, should be concentrated at great strategical points.

Such broadly speaking is the basis on which our transport should be organized in time of peace, but as general principles and cursory generalizations are often misleading, it will be necessary to examine the subject more minutely, to describe in detail the skeleton which should be framed in peace, and and to consider how when war comes, the framework is to be filled in, and the skeleton transformed into a great living machine. With this object in view we propose describing :—

(1) The peace establishment to be maintained by a native Infantry regiment.

(2) The kahar establishment to be maintained at a second class station such as Ferozepore or Cawnpore.

(3) An ideal Transport Depôt maintained, say at Kohat.

(4) Organization of a coolie corps as suggested for Assam.

These examples will serve as a pattern for the whole, and illustrate more or less the lines on which is built the organization advocated in these pages.

Regimental Transport.

The strength of a native regiment of Infantry may for purposes of calculation be taken at

1 Commandant
7 Other British Officers
16 Native Officers and Hospital Assistants
600 Rank and File, drummers etc.

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It is true that on a regiment taking the field, its strength is increased to 800 sepoys, but rarely will it happen that there are more than (six hundred) 600 men with the colours.

Irrespective of the muleteers, camel drivers and hospital establishment, followers as below would accompany a regiment of the above strength on Cabul scale. An 8 company organization has been taken as the basis of calculation, it would however be more economical and in every way more convenient, if regiments took the field with 6 companies of full strength, leaving the cadre of 2 companies to form a depôt.

Officers servants including horse attendants		... ...	24
Native officers' servants	... ...	... ...	8
Mess servants	... ...	... ...	3
Quarter Master's Establishment	Tindal	... ...	1
	Lascars	... ...	8
	Bildars	... ...	2
Company servants	Coolies	... ...	16
	Puckalies	... ...	8
	Bheesties	... ...	8
	Mehturs	... ...	8
		Total ...	86

The hospital establishment consists of 8 servants and according to the Cabul scale of a large number of doolie bearers, at the very lowest estimate 150. But this system of affiliating sick carriage permanently to regiments is mischievous, involving, as it does, an excessive waste of power in regiments which are healthy, and have not suffered much in action.

All a regiment requires, actually present with it, is an establishment sufficient to attend to its immediate wants on the march, and the means of removing wounded men in action from the fighting line to the bandaging stations, in other words to the spot where the regimental surgeon has established himself. Judging by European experience the regimental doolie bearer establishment might be fixed at

1 Doolie with 6 bearers	
8 Dandies „ 32	„
1 Mate	
Total	39

The regimental hospital on service is not the place for *treating* sick men, it is merely a sort of receiving station for physicing men, and bandaging wounds, the above establishment ought therefore to suffice. The field hospitals are the proper places for treatment and to them men would be taken by the doolie bearer companies attached to those field hospitals. The following table, based on the Cabul scale and the establishments given above, shows the number of transport animals required for a native Infantry regiment.

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Transport required for a Native Infantry Regiment.

	Camp Equipage.	Baggage.	Servant's Baggage.	Total.	Camels.	Mules or Ponies.	Remarks.
Commandant	150 lbs.	*130 lbs.	†40 lbs.	320 lbs.	1		As officers are very liable to be sent on detached duty, it is better to give a mule to every British or ½ a mule to every Native officer than to allot camels.
7 Other officers	560 ,,	*630 ,,	†280 ,,	1470 ,,		7	
16 Native officers.	640 ,,	*640 ,,	†160 ,,	1440 ,,		8	
Mess ..	1 Lascar Pal.	320 lbs.	80 lbs.	873 lbs.	2	1	As the one tent may do for both, it is better to allow discretion in the allotment of baggage etc. for Mess and Office, merely detailing 2 camels and 1 mule for all purposes.
Office ..	150 lbs.	80 ,,	..				
Guard tents ..	2 Lascar Pals	..	..	..	1		Amongst the company servants are included lascars, cooks, mehturs, bheesties, puckalies and camel drivers.
600 men .. and 60 followers ..	16 Sepoys Tent	..	..	..	16		
		12,000 lbs.	600 lbs.	12,600 lbs.	32		
Quarter master's stores.	..	830 lbs.	..	830 lbs.	2		Including baggage of tindal and 2 bildars.
Hospital ..	2 Sepoys' Tents	800 ,,	..	800 ,,	2		Amongst hospital-followers are included the kahar establishment.
Hospl. followers	1 do,	400 ,,	†470 lbs.	870 ,,	2		
Arms of sick ..	..	4	..	..	4		
Blankets ..	CABUL SCALE			..	8		Viz:—1 extra blanket and sheet per man and 15 per cent. of poshteens.
Waterproof sheets.							
Poshteens ..							
Ammtn. 1st Reserve.	..	..	..	18,000 rounds		18	Allowing 500 rounds per mule box and 2000 per camel box.
Ammtn. 2nd Reserve.	..	..	..	60,000 ,,	15		
Armourers' Tools	..	..	..	..		1	
Cooking utensils and intrenching tools.	..	..	..	..	8		One camel per company to carry cooking utensils and a small proportion of tools.
Intrenching tools.	..	..	..	..	2		44 picks and 44 shovels carried separately.
Spare animals..	..	..	..	..	5	5	
				Total ..	100	40	

* Cooking Utensils included.

† Baggage of muleteers and camel drivers included.

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If the above estimates are at all correct we may conclude that the total Regimental Transport required will be

38 Doolie bearers.
1 Mate.
100 Camels.
40 Mules.

The camels will require at least 25 attendants and the mules 40. The Cabul scale lays down one muleteer to every three mules, but for regimental transport the more liberal scale of a muleteer per mule will be found to answer best. An officer is liable at any moment to be sent on detached duty where no other mules perhaps will accompany his party, a muleteer is therefore necessary for every private mule. The mules carrying the 1st reserve of ammunition are constantly liable to be sent under fire, it will therefore be advisable to have a full complement of muleteers accompanying them. Even if the number is excessive, the superfluity may be regarded in the light of an escort, if organized on a semi-military footing as proposed hereafter.

Given the amount of transport required in war, it remains to decide what nucleus is to be kept up in peace and how that nucleus is to be organized and employed.

As already pointed out the transport maintained in peace should be sufficient to enable a certain proportion of the regiment, say six companies or 500 men, to move on the very shortest notice to repress local disturbances. Such a force would probably be accompanied by 6 British officers, each of whom would require a mule for personal equipment, food and cooking utensils.

Each company would require 1 camel for blankets, and one for cooking utensils and intrenching tools. Reserve ammunition as follows might also be taken, viz:—

	Rounds.
3 Camels at 4000 rounds each	=12,000.
12 Mules „ 1000 „ „	=12,000.
Total ...	24,000 or 48 rounds per man.

This gives a total of 15 camels and 18 mules which it would be at all events advisable to maintain in peace, or allowing for contingencies, 20 camels and 20 mules or ponies, not an extravagant allowance considering the Punjab frontier regiments maintain 55 camels and 40 mules.

As regards the 'personnel' it would be an advantage to fix the peace establishment at 2 men per animal. Firstly because the animals would be the better cared for with two attendants apiece. Secondly because the military training of the men could be the better conducted. And thirdly because a body of 40 muleteers and 40 camel men would be adequate for the care and management of the regimental transport on field service scale: viz 100 camels and 40 mules.

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We thus arrive at the following results regarding the organization of Regimental Transport.

(1) The peace establishment might be fixed at

1 Mate 38 Kahars	} Sick bearers.
20	Camel Surwans, 1st grade.
20	„ „ 2nd grade.
1	Camel Sirdar or Mate.
20	Syces.
20	Grass cuts.
1	Mule Sirdar or Mate.
2	Mochees for repair of saddlery.
20	Camels.
20	Mules or ponies.
1	Transport Jemedar in charge of the whole.

(2) The augmentation required in war would be 80 camels and 20 mules.

(3) The 'personnel' maintained in peace would be sufficient for war.

The next point to consider is, how the peace establishment of men and animals is to be employed. A certain number of animals are always useful for regimental purposes, such as carriage of guards, bedding, conservancy carts, escort duty, etc.; but the number so utilized cannot be great. The rest, if heavy unremunerative expenditure is to be avoided, must be hired out to private individuals, municipalities, cantonments etc. At most stations this might easily be done, more especially if the transport was of such a nature as to provoke demand. Pack ponies in lieu of mules would command such a demand. Officers, British and Native would gladly avail themselves of these ponies for private use, in return paying for their keep and being held responsible for their condition. The animals could of course be mustered monthly and every precaution should be taken to prevent abuse of such a privilege. Other residents in or near cantonments might also be permitted to make use of regimental animals on similar terms, a condition being made that the animals should always be available at a few hours notice. The employment of the men is a more difficult question and involves the consideration of a variety of intricate details connected with enlistment, pay, training, clothing, and equipment.

Enlistment:—Doolie bearers should of course be recruited chiefly from the kahar caste; the camel surwans, syces, etc. from the various low caste which usually engage in such pursuits; none but able bodied men fit for military service should be taken in any capacity. Every follower of the regiment from the tindal to the hospital mehtar should be capable of bearing arms, and should be discharged when no longer able

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to do so. They should be enlisted on the same conditions of service and discipline as the sepoy.

Pay:—In civil life a kahar, syce or grass cut gets Rs. 4 or 5 according to his position. Give him Rs. 6 or 7 according to his grade in the service, with prospect of a pension of three rupees after a certain term of years, and he will be reconciled to the altered circumstances in which he finds himself placed as a servant trained to arms. For the transport establishment the rates of pay might be fixed as follows.

		per mensem.
Transport Jemedar	Rs.	40
Camel Sirdar Mule Sirdar Doolie Mate	„	12
Camel Surwans 1st grade Syces	„	7
Camel Surwans 2nd grade Grass cuts Kahars	„	6
Mochees	„	10

Training:—Every native follower in a regiment should be trained to arms. Such a measure alone will greatly facilitate operations in the field. The followers have been the curse of every Asiatic campaign. Train them to arms and they will cease to be so. Instead of requiring escort for themselves, they will themselves become escort. None but men able to defend themselves should be allowed to hamper the movement of an army in a barbarous country. In Europe the civilian's dress ensures his safety, in Asia it only marks him out for attack. The training of *all* followers maintained in peace thus becomes an object of the utmost importance. The native follower, be he lascar, syce or kahar should when a recruit be taught to shoot and be put through squad drill. The transport follower should also be instructed in a few simple manœuvres with animals, such as front forming, forming to a flank, forming double column from single column, and vice versa. The knowledge thus acquired should be kept up by a short annual course of drill and by firing off 20 rounds or so during the year.

Clothing and Equipment:—The follower should be supplied with a uniform of some cheap and serviceable material, the pattern of which should be adapted to the service he has to perform, rather than to the demands of personal appearance. His equipment should consist of a short carbine to be slung on the back, haversack and water bottle, belt and ball-bag of brown leather and 20 rounds of ball ammunition.*

With all our followers, lascars, cooks, bheestees, mehturs, kahars syces, camel surwans etc., so drilled and armed, they would not be the

* The bheestie however has quite enough to do to carry his *mussuk* he should be supplied with a revolver in lieu.

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helpless rabble they now are, and the strength of escorts etc. would be considerably reduced. In fact, mustering as they would from 150 to 200 armed men they would in themselves form a sufficient and efficient escort for the whole of the regimental transport. We have not however yet pointed out how all these additional followers, kahars, camel drivers, syces etc. are to be profitably employed in time of peace. If a mule or pony is hired out, it should be on the condition that its syce and grass-cut are taken with it, the employer paying the market rate of wages and Government making up the difference. Whether hired out or not, the mules and ponies will always require two attendants. Each camel will require only one attendant, the drivers should therefore be periodically relieved so as to habituate every man to the care of animals. The kahars, camel drivers etc. not employed as above, say some 50 or 60 men might be utilized as station orderlies, hospital guards etc., thus relieving highly trained soldiers from what is to them unprofitable employment.

It is difficult, almost impossible, to estimate the cost of an establishment such as that proposed, as it will depend entirely on local circumstances and the extent to which carriage can be hired out or otherwise utilized in the station.

Do what we will however, doubtless the whole of the transport establishment will *not* be utilized, and the scheme will therefore entail considerable additional expense. But there would be compensatory advantages, not the least of which will be the ease with which a regiment will pass from a peace to a war footing. All that need be done will be to recall all followers and animals employed outside the regiment, and to send an emergent indent on the Commissariat for twenty odd mules and eighty camels to be supplied at that point where the regiment would be required to leave the railway. The equipment of course should always be kept in store by the regiment itself. Not another follower of any description need be entertained, every one would be in his place, properly clothed and equipped for active service. Such are the broad lines on which Regimental Transport should be organized. These principles can be applied to all corps, Native or European, details only will differ. Into such details it is impossible to enter with the limited space which is here at our disposal.

(2) Sick Carriage.

In India and Asia generally sick carriage must be carried out by means of doolie bearers. The principles on which sick carriage in the field should be organized have already been pointed out. It remains to be seen how in peace we are to prepare the means for adopting such an organization and for ensuring its efficiency.

The doolie bearers, like all other followers, must be trained and armed men. This point is we contend a *sine qud non* in Asiatic warfare, but we cannot have men so trained, unless we maintain them in

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time of peace. The maintenance therefore of kahar establishments becomes a matter of absolute necessity. Luckily their maintenance will not involve any great additional expenditure as they can be utilized as punkah-pullers for more than half the year in most parts of British India. Doolie bearers are now so utilized and for the sake of economy it is essential that they should be always so utilized even when organized on a semi-military footing.

The necessity for employing punkah-pullers wherever British troops are stationed, renders it necessary that the doolie bearers, maintained for the use of the army, should be dispersed throughout India. The objections that apply to the dispersion of transport animals, do not however bear upon the dispersion of the kahar establishments, as the facilities for promptly and rapidly moving *men* at the present day are of such a nature as to counteract the disadvantages of dispersion.

We have not at our disposal exact figures to guide us in our calculations, but the total number of punkah-wallahs employed for the troops in India cannot be less than 20,000, a number amply sufficient to supply all the wants of the medical department of an army of sixty or seventy thousand men, such an army indeed as no Indian general will probably ever have the good fortune to command. It follows then, that if instead of hiring decrepit old men and weak, knock-kneed boys, we were to engage as punkah-pullers only sturdy able-bodied men fit for employment as doolie bearers, and to organize them on a semi-military footing, we should at very little extra expense secure the services of a large body of men, trained to defend themselves and fit for service anywhere.

The organization we propose is as follows :—

Doolie bearers to be enlisted for general service and to be formed into companies under European officers. Each company to be organized in three divisions each of four squads. The composition of a company might be

1	European Officer.
1	Staff Sergeant.
3	Pay Sergeants (one per division.)
3	Jemadars do.
12	Mates (one per squad.)
450	Doolie bearers.
1	Apothecary.
1	Hospital Assistant.
3	Puckallies (one per division).
3	Bheesties do.
3	Mehturs do.

At the larger stations such as Peshawur, Umballa and Lucknow there should be two such companies. At the smaller ones such as Multan or Cawnpore, one such company would probably suffice.

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On the outbreak of war 300 doolie bearers with complete staff might be at once despatched on service, the remaining 150 being left to form the nucleus of a newly raised company. British regiments, not on service, could find the European staff for these new companies whilst the native grades could be filled by promotions from the mates and doolie bearers, the depôt establishment of the latter being completed by enlistment. Of course *some* of the old staff would be retained to aid in the formation of the new company, new men, British and Native, taking their places in the company.

The officers for these doolie bearer companies might perhaps be best obtained by giving commissions as lieutenants to active and deserving warrant and non-commissioned officers. This would offer an opening to the aspiring soldier, which our service now so rarely affords. After so many years service in the subaltern grade promotion to the rank of captain might be given, but with that rank, promotion should cease, the honorary rank of major however being given on retirement. The pay of the two grades might be Rs. 250 and 350 respectively, the functions however of lieutenant and captain being precisely the same, and consisting in the entire supervision of their companies, as regards enlistment, pay, clothing, drill, training, discipline, employment, discharge and pension.

The European non-commissioned staff would be drawn from British Infantry regiments, the men being brought after a year's probation on the unattached list. The staff sergeant would combine the duties of sergeant major, quarter master sergeant and orderly room clerk. He might receive Rs. 30 staff in addition to pay of rank, while the divisional pay sergeants might each receive Rs. 20 staff. These non-commissioned officers should be eligible for promotion to the commissioned grades in the doolie-bearer establishment, and generally speaking they should have primary claims on such commissions.

In each division subordinate to the pay sergeants there should be a native sirdar or jemedar drawing say Rs. 30 per mensem, and to every squad a mate on Rs. 12. The kahars might be divided into three grades according to length of service and conduct, and receive respectively Rs. 8, 7 and 6 per mensem. After a given number of years, they should be entitled to pension. All should be uniformly clothed in the manner considered most suitable, and every man, the jemedars excepted, should be armed with carbine and "kukri."

During the hot season the men would be employed as punkah-pullers, in the cold they would be put through a course of drill and musketry, the former however not advancing beyond the company stage. With doolie bearers thus drilled, armed and commanded, we might expect order on the march, and rely on the men having sufficient pride and confidence in themselves not to desert the wounded when attacked,

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In fact it would be but rarely that sick convoys would require any other escort than a few sowars to give timely notice of intended attack, and thus enable the convoy to form up to meet it.

On service these kahar companies would be entirely under the orders of the medical department. To each field hospital a body of the requisite strength would be permanently attached, while the remainder would be employed in working from the field to the general hospital, and thence to the base.

Transport Depots.

At the commencement of this chapter we pointed out the necessity of breaking up the present movable columns, and concentrating all animals at frontier stations or certain strategic centres. We now propose to examine an organization which we deem suitable to one such depôt situated for example at Kohat.

The size and number of such depôts will depend on the strength of the army for which it is deemed essential to provide, and the proportion of carriage it may be considered advisable to maintain to enable us to pass from a peace to a war footing without extraordinary exertion. Whatever may be the size of a transport depôt, it must consist of a certain number of organized corps, each capable of expansion, and for the sake of illustration we propose to fix the strength of the Kohat depôt at two camel and one mule corps. The peace establishment of each corps to consist of

1 British Officer.
1 Staff Sergeant.
3 Pay Sergeants.
3 Sirdars.
12 Mates.
300 Muleteers or Camel Drivers.
1*Farrier Major (native.)
6*Nalbands.
1 Saddler.
3 Blaksmiths.
3 Mochees.
1 Salootrie.
1 Apothecary.
1 Hospital Assistant.
300 Mules or Camels.

Besides the above at each depôt there would be a depôt-staff of

1 Field Officer (Depôt Commandant.)
1 Adjutant and Quarter Master.
1 Docter.
1 Veterinary Surgeon.

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* In mule corps only.

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Now on service 100 muleteers or camel drivers are considered sufficient to tend and manage 300 mules or camels, therefore the 300 men of a transport corps are sufficient to superintend 900 animals. In other words the personnel of a transport corps such as that given above would be sufficient for three times the number of animals maintained in peace, and we should with very little difficulty be able to form three corps from every one corps so maintained.

Each corps would be organized in peace in three troops each of four sections. Each section or squad would be commanded by a "mate" each troop by a pay sergeant and under him a sirdar. Exclusive of artificers the strength of a troop in peace would be

1 Pay Sergeant.
1 Sirdar.
4 Mates.
100 Men.
100 Animals.

If in war it were required to expand this troop into a complete transport corps consisting of

1 British Officer.
1 Staff Sergeant.
3 Pay Sergeants
3 Sirdars.
12 Mates.
100 Muleteers or camel drivers.
300 Mules or camels.

We should simply have to promote the pay sergeant to the rank of staff sergeant, bring in three non-commissioned officers from the British Cavalry or Artillery to act as pay sergeants, promote two mates and ten men to the higher grades and entertain ten new men and 200 mules or camels. For two out of every three troops we should also have to bring in an officer to take command of the corps thus newly formed.

The men of these transport corps would thus be all fully trained, and a transport depôt on the scale here supposed would without much difficulty be able to form, from the peace nucleus, a transport train consisting of three mule and six camel corps, each corps consisting of 300 animals and the whole able to carry over 11,000 maunds.

Now the question is how, when mobilized, these transport troops and corps are to be employed, and it appears that they must in the first place be utilized in carrying stores between the advanced magazines and the army. In fact the requirements of Departmental Transport must be taken into consideration, before supplying the wants of General Transport. The nearer to the enemy, the more military in its composition must the transport be, and highly organized and efficient transport becomes far more necessary where it becomes actually a question of

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bringing food and ammunition to the actual consumers, then where it is merely a question of filling up the various magazines. It is then Departmental Transport which must first be provided for from the transport depôts.

The amount of transport required for this purpose, it is difficult to calculate, but as the advanced magazine is seldom more than four days in rear we may roughly estimate that if 20lbs of food and munitions of all sorts be provided for every soldier and follower in front, that that amount will suffice under all probable contingencies.

A division of six or seven thousand combatants will with followers comprise about 10,000 men ; departmental carriage for 200,000lbs or 2500 maunds will therefore be required. Reckoning the load of a camel at four maunds and that of a mule at two, a camel corps will carry 1200 maunds and a mule corps 600. Thus two camel corps and one mule corps will be sufficient and more than sufficient, for carrying out the Departmental Transport of an ordinary division, provided Regimental Transport exists in all its parts.

Supposing then that the Kohat depôt was required to provide only for the wants of such a division operating in the Kurrum valley, it would still have available two mule and four camel corps for the purposes of General Transport, from the point where, pack transport would begin. As the animals thus employed would be worked on the stage system, and would seldom or never be called on to make forced marches, their loads might with advantage be increased to 400 and 200lbs respectively. Now it may be roughly calculated that 4lbs per man of food, ammunition and supplies of all sorts must be carried each day along every stage. 10,000 men therefore require carriage for 40,000lbs on every stage, a quantity which can be carried by 200 mules or 100 camels. It follows then that for the General Transport of the supposed force we must employ on each stage either two troops of mules or one troop of camels. The four spare camel corps and two spare mule corps can therefore undertake the General Transport of the force for 15 marches.

With a cart road to Thull, and nothing but carts employed between Thull and Kohat, such a depôt as that proposed would enable us after mobilization to advance our magazines fifteen marches beyond Thull or in other words to Cabul or Ghuznee, and as the force would hardly reach those points under a month from the commencement of hostilities, time would be given for the organization of additional transport if an advance beyond those points were in contemplation. For simple punitory expeditions amongst the hill tribes, the depôt on its peace establishment would provide amply for requirements. Let us now consider how these transport depôts should be supervised, and the men enlisted, paid, clothed, trained and employed.

At the head of each depôt shall be a specially selected Field Officer who might hold the appointment for five years, as if on the

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staff of the army. It should be his duty not only to superintend the training, discipline and interior economy of the transport corps under his charge, but to collect all information possible regarding the resources of the country in front, more especially as regards water, forage and animals. He should have lists drawn up of all contractors, dealers and headmen capable of supplying him with animals etc., and he should have schemes always prepared for the mobilization and augmentation of the transport, under every possible contingency. No detail necessary to permit a force to move with rapidity and certainty should ever be neglected. The officers of the depôt staff, viz:—Adjutant, Doctor and Veterinary Surgeon, might be appointed for three years, the appointments being held in the same manner as other posts on the staff. The officers in command of transport corps should be subaltern officers of the army at large, attached for duty at the depôts for a certain period—say one year—and receiving while so attached Rs. 100 'staff' over and above the pay of their proper appointments. In this way a large number of officers might gradually be trained in duties connected with transport, such as veterinary management, fitting harness and saddlery, interior economy of transport corps etc.

We should always thus have a large body of officers to fall back on, possessed of the knowledge requisite in a transport officer, and there would, on mobilization, be no difficulty in filling the increased number of commands. Qualified officers would simply be called for from regiments not ordered on service. In short transport depôts should be schools in which officers would receive that instruction in animal management and transport duties, which is so essential to the efficient exercise of command. The frightful losses sustained in our late campaigns is to a great extent the result of the ignorance of our transport officers, on first joining.

The non-commissioned officers would be obtained from the British service, chiefly from the Artillery and Cavalry; they should be placed on the unattached list and paid in the same manner as those employed with the kahar companies. In order to secure a reserve to meet the demands of mobilization, men from British regiments might also be temporarily attached as supernumaries to learn the work, a small amount of extra pay being given.

The native ranks would of course be enlisted chiefly from those castes and races which are principally employed in tending animals. Lobana Sikhs may be particularly recommended for employment in the transport. Pay and pension should be much the same as that of men entertained for Regimental Transport. So also clothing and equipment, the men being armed with breech loading carbines and "kukris," the European non-commissioned officers and the native jamedars with swords and revolvers. Their training should consist in a short annual course of musketry, and in a limited amount of drill, both as Infantry companies and as transport columns, and they should receive careful instruction in fitting harness and loading animals.

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The animals should be the property of Government, and during peace might to a certain extent be utilized in conveying public and private stores from the railway termini to the advanced posts on the frontier, or to military stations away from the line, in the same way as the Government Bullock Train in the Punjab now does. Such employment however should not be so excessive as to interfere with the military training of the men.

As regards mobilization, that is to say the transition from a peace to a war footing, if the operations were likely to be on an extensive scale, we should, as already shown, have to treble the number of animals. This it would not be easy to do, unless in peace, means were taken for registering all suitable carriage in the districts contiguous to the transport depôt, such carriage being subject to hire or purchase whenever required by the Government. Option of exemption from such liability, by payment of an annual tax, should however always be given, as it would be hard to compel a man to part with an animal which he particularly valued. At the same time the tax would involve no great hardship, as it would fall chiefly on the rich. If a man values his horse or his camel at more than Government rates, he can afford to pay a small tax for exemption, if he does not value the animal above the established rates, then there is no reason why he should demur at registration.

Coolie Corps.

We are so often engaged in little wars in Assam, the wild districts of Orissa or the Straits, where the only form of transport possible is that by human agency, that the formation and permanent maintenance of a coolie corps becomes a very desirable matter. The difficulties and dangers incurred by employing unorganized mobs of carriers have been illustrated over and over again in Ashanti, Bhutan and elsewhere, while the invaluable services rendered by the Chinese coolie corps show most forcibly the immense advantages of employing armed and organized bodies of men.

As Assam is most often the scene of operations requiring coolie labour, it is there that such a corps should be located, its services however being available in any part of India or beyond sea.

A coolie corps might consist of two or more companies each being organized in three divisions of four sections. Each company might consist of

1	European Officer.
1	Staff Sergeant.
3	Pay Sergeants (one per division)
3	Sirdars do.
12	Mates (one per section)
300	Coolies.
1	Apothecary.
6	Bheesties.
6	Cooks.

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In the Duffla expedition four such companies were employed, and four companies might perhaps be the most suitable number for a coolie corps. The staff of the corps would comprise

1 Commandant.
1 Adjutant and Quarter Master.
1 Medical Officer.

These would be staff appointments held for five years. The company officers should be energetic young men taken from the general body of the staff corps and attached to the coolie corps for two or three years. The Sergeants would be obtained from British Infantry regiments, and after a certain probation placed on the unattached list. As regards pay and duties, they would be in the same position as the Transport Sergeants already described.

The men should be enlisted from suitable castes, should be uniformly clothed, armed with carbines and "kukris," and drilled to a reasonable degree. Armed, drilled and disciplined they could dispense with escorts, and the whole combatant force could be pushed to the front, while the coolie corps would not only carry the supplies, but also, in a great measure, take care of the communications.

In the matter of pay and pension the men should be on the same footing as the regimental kahars. If for any particular campaign it should be necessary to augment the corps, the simplest way would be to expand the divisions into companies obtaining the necessary staff of Europeans from the British Infantry, and the rank and file by volunteering from the doolie bearer companies.

A coolie corps cannot be regarded as part of the General Transport system of the country, but as an exceptional expedient to meet a particular want.

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CHAPTER III.

In the two previous chapters we have shown, what is the organization which European experience has proved to be the best, and to which we should assimilate the organization of transport in India, the inapplicability of our present system to the end proposed, and the establishments which should be created and fostered to attain that end. It remains for us to recapitulate the main features of the system we have advocated, and to show how the harmonious working of the whole can be secured. We have described the various units which should compose the peace establishment, but we have not indicated how in peace these various units are to be controlled, nor what department should be held responsible for the efficiency of the whole system.

The arguments that apply to a state of war and movement no longer have any force. In peace it is the Commissariat that has the greatest facilities for the purchase of animals and the grain required to feed them, it is the Commissariat that can best utilize the carriage maintained by transport depôts at frontier stations; and it is the Commissariat who can best provide for the employment of doolie bearers either as punkah pullers or otherwise. During peace then all but Regimental Transport should be placed under the supervision of the Commissariat Department. The Commissary General should in peace be the head of the transport, and to him must the various executive Transport Officers look for orders. As however the additional work thus imposed will be more than he can efficiently perform, it will probably be necessary to appoint a specially selected officer as "Secretary" or Assistant to the Commissary General in the Transport Branch.

When once the transport has been placed on an effective footing, no further administrative staff should be necessary. The Secretary or Assistant should be the channel of correspondence on all transport matters. It should be his business to furnish the Commissary General with complete information regarding the establishments maintained and the deficiencies therein, as well as to examine and collate all schemes for mobilization.

Now that we have traced somewhat in detail the lines on which transport should be organized, and the nature of the nucleus which should be maintained in peace, we shall proceed to summarize the principles which should be observed in carrying out this organization, and the results which might be expected therefrom.

(1) Every regiment should always maintain a "personnel" sufficient to meet all requirements, which "personnel" should be drilled and armed. Harness, saddlery etc., for the full complement of animals should also be maintained. The only augmentation required would be

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in animals which would be obtained, at the railway termini, through the Commissariat or through civil officers, on hire at fixed rates.

(2) A large corps of drilled doolie bearers should be formed on a system capable of expansion, at a reasonable additional cost. The doolie bearers being disseminated throughout India, could without difficulty, be utilized in peace, and could, thanks to railways be rapidly concentrated for war.

(3) By means of the above establishments we should always be able to act with promptitude in the suppression of local disturbances.

(4) The General Transport of the army instead of being scattered all over India, would be concentrated at points where its services would most probably be required.

(5) The animals belonging to it could, in the absence of railway competition, be employed in the carriage of stores public and private.

(6) The whole of the "personnel" would be drilled and armed, an incalculable advantage in Asiatic warfare. The officers would be men accustomed to transport duties.

(7) As regards carrying power, the peace cadre could with comparative ease be trebled, the peace organization being adapted to the exigencies of war.

Such are the main features of the system proposed in these pages. To illustrate the working of such a system in war, we propose to take a hypothetical case, and to apply to it the ideas herein propounded.

War is imminent with the Ameer of Cabul, and everything is in exactly the same situation as it was on the 21st September 1878, excepting that a railway connects Peshawur with India, and that the Transport Service as detailed in these pages is actually in existence. Every regiment provided with its peace complement of transport. Doolie bearer companies stationed wherever British troops are quartered. A Transport Depôt of three camel and two mule corps actually present at Peshawur. All the animals in the adjacent districts registered, and every arrangement made *on paper*, for the mobilization of the depôt and its augmentation to six mule and nine camel corps.

The Viceroy determines that a force of four Brigades of Infantry and one of Cavalry shall operate by the Khyber line but that for political reasons it shall not advance till the 20th November. The Commander-in-Chief therefore decides not to move a single soldier to Peshawur till a few days previous to the date fixed for the commencement of hostilities. The railway will enable him to bring up his troops fast enough when wanted, so it is useless concentrating

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them merely, to devour supplies and attract disease, * meanwhile it can be utilized in the conveyance of stores, so that when the army does assemble, its supplies will be ready at the base. Thanks to the railway we start with this advantage that we can rapidly accumulate stores from an extensive area, and at the same time prevent the consumption during accumulation which would ensue were the troops themselves on the spot. The six weeks preceding concentration of the troops, are therefore employed in collecting and storing supplies, in making cart roads to Jumrood and organizing a cart-train for service thereon, in mobilizing the transport train, in augmenting the Regimental Transport and in sending it down by road to Peshawur. It is only during the second week in November that the troops themselves are moved from their peace cantonments.

They have not been hurried, and so their equipment in every detail is complete. By the time the force collects, Regimental Transport is on a war footing, the required number of doolie bearer companies are ready, nine camel and six mule corps complete, in every respect and under trained officers are prepared to move, and a hired cart-train to work between Peshawur and Jhelum has been organized to assist the railway.

The Departmental Transport for the force, which with followers amounts to 16,000 men may be estimated at one camel and six mule corps each of 300 animals and capable of carrying 22 lbs. of supplies for every man in the force irrespective of Regimental Transport. The remaining eight corps or 2,400 camels are available for the General Transport of the army. Previous to the 20th November, these corps are employed as well as the cart-train in pouring stores into Jumrood, so that when the force does advance Jumrood is crammed with stores and has actually become the base of the army.

On the evening of the 20th operations commence, but the 'General Transport' still continues working between Peshawur and Jumrood till the 22nd, when orders are issued that the whole, cart-train excepted, is to commence working beyond Jumrood, four corps taking up stores to Ali Musjid each day and returning the next. In this way by the night of the 24th, 18,000 maunds have been deposited at Ali Musjid or more than three weeks supply of food ammunition &c. for the whole force at Ali Musjid and beyond.

On the night of the 24th orders are given to extend transport operations to Lundi Kotal; the four camel corps which halted that night at Ali Musjid move on next day with 6000 maunds. The next night orders are given to establish magazines at Dakka, and the eight camel corps are distributed over the several stages, with instructions to complete a month's supply for the garrisons of each post, and after that to devote themselves to filling the advanced magazines. Regimental

* In 1879 the greatest error committed by the Russian General in the Turkoman expedition was the too early concentration of troops at Tchikisla.

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Transport of corps detailed for duty at Jumrood, Ali Musjid etc. to aid in transporting stores *from the depôts immediately in rear to their own magazines.*

On the 26th instead of halting at Dakka, the force being amply provided for, is able to continue its march on Jellalabad, reaching that town on the 29th. By that date more than a month's supplies for the garrisons of the various posts will have been stored, and the maintenance, not the defence, of the store depôts at those points can safely be left to the Regimental Transport of the corps there stationed. The advanced magazines are transferred to Jellalabad, and the whole of the 'General Transport' can be set free for the supply thereof.

Orders are accordingly issued on the night of the 29th directing one camel corps to work on each of the seven stages between Jumrood and Jellalabad, the 8th corps being ordered up to Jellalabad to assist the Departmental Transport in bringing in supplies from the neighbourhood. By the 2nd December these orders are carried out, and the regular uninterrupted supply of the advanced magazine from the base will have commenced. Irrespective of local supplies brought in by the inhabitants or the transport at head quarters, 750 maunds of stores are conveyed every day along each stage and deposited at Jellalabad.

For political reasons it is decided to make no further advance and the force goes into winter quarters. Regimental and Departmental Transport remains subject to the control of corps and departments, but the General Transport is under the orders of the officer commanding the line of communications and his subordinates, who are the Station Staff Officers at Jumrood, Ali Musjid, Lundi Kotal etc. If expeditions to repress local annoyances have to be made, and the Regimental Transport engaged is insufficient to meet the exigencies of the case, the commandant of communications is in a position to say what General Transport can be diverted for the purpose, his orders on the subject being communicated and carried out by the Staff Officer under him at the several stations.

As the winter draws to an end, the troops along the line are pushed on and others take their place, the transport too is moved on, and fresh transport, organized since the outbreak of war, takes its place towards the rear, but all these movements need cause no hitch in the arrangements, the station staff officers do *not* move. They are the pulleys on which the ropes are worked. The ropes may be new, but they do not jam. There is no friction, for the pulleys are smooth and well greased. There is a place for every one, and every one knows his place. The transport is not a disorganized, helpless, half-starved, ill-clothed, discontented rabble, for thanks to organized supervision everything is conducted on a prearranged system, the men are drilled, armed and able to protect themselves, there is no systematic cutting up of followers, they are throughout as well clothed and fed, as regularly paid and cared for as the soldier to whose wants they administer. Hospitals for sick

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followers and sick animals are established, the losses in both are thus reduced to a minimum, and discontent or desertion are almost unheard of.

Our expeditions too often consist of an army protecting a mob of followers and a mob of followers administering to the wants of the army. These are not the primary objects of any expedition, nor do such conditions tend to the speedy, economical and satisfactory termination of a campaign. This mob of followers, this want of system, is the most serious blot, in all our arrangements for war. It is the curse which hampers the movements of every commander, and which offers to the enemy his best opportunities. The greatest, the first *desideratum* of a Transport Service for Asiatic Warfare is, the power in every individual with the force to protect himself. Depend upon it until the well being of every single man, from the general in command to the humblest sweeper is assured, the transport of the army, however well devised, will neither be efficient nor economical. There will be loss here and waste there. Men will die, desert or encumber the hospitals, animals will perish or break down, and money will be lavished right and left to remedy the evils caused by want of forethought and lack of system.

It has often been said that fields of Asiatic warfare are so varied as to preclude the adoption of any fixed system, and the adaptation of German ideas to Eastern practice has consequently been derided, but it cannot be denied that some system is better than none at all. Give us a system and details can be altered at will. It may be urged that the finances of this great empire are unequal to the additional burden involved by such measures as those here proposed. It may be so and if it is, there can be but one course to pursue—Reduce the army!—Better an army of 200,000 who can go anywhere and do anything, than 300,000 men who cannot move from their cantonments without weeks of preparation and then only slowly, and toilsomely.

Give but the means of acting up to the motto "Frappez fort et frappez vite" and not a chief from Herat to Mandalay will dare to lift a finger, in opposition to the wishes of the "Great British Government."

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ESSAYS

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE."

HONOURABLY MENTIONED.

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II.

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

BY

MAJOR M. J. KING HARMAN B.S.C.

Assistant Quarter Master General.

"PREPARE."

Without efficient Transport, an army cannot move, and to be thoroughly efficient such transport must be well organised equipped and disciplined; this however is next to impossible unless it is under military control and direction.

It has been proved over and over again that systematically organised transport means the increased mobility and efficiency of the Army, and it is well known that many of our Wars and Expeditions have been greatly prolonged, and success too often jeopardised owing, not so much to actual want of transport as to the almost entire absence of system and organisation of that transport.

The late Colonel Home R. E. tells us that "Rules" are but guides which must "be intelligently, not blindly followed."

"Practice and experience alone can decide many points, and give "us the power of applying rules; but theory, by which is really meant "the experience obtained by others is not the less important and "valuable. Principles are but guides, which must be revised, examined "and verified after each war, after each discovery in military art. The "great success of Gustavus Adolphus, Frederic, Marlborough, Napoleon, "Wellington and Von Moltke are but due to careful consideration and "appreciation of the effects of various discoveries in the Art of War." "There is no finality to the Art of War" and the organization and handling of Army transport is one of the most important branches of this Art. De Ternay says with truth that the manner in which the the military machine is put together at the opening of a Campaign exercises much influence over the manner in which it performs its duties. There is the constant prohibition on expenditure of money on anything that does not, or will not pay; the desire to do everything cheaply; the anxiety for retrenchment and consequently any scheme which may be put forward for a permanent Transport is met by the *query* "how will you employ the men and animals in peace time so as "to pay for their keep?" and unless this is satisfactorily answered the proposed scheme is nearly sure to be rejected; and yet how, may I ask

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does the standing transport of the Punjab Frontier Force pay for its keep?—or how do the large number of Commissariat elephants and Artillery Bullocks pay for their's, and this I think shews our inconsistency.

If a thing is worth doing at all, it is worth doing well, other Nations have found this out and it is high time that we did so too, and that we applied the rule to our Transport service for Asiatic warfare, for if we look for success in war we must have a properly organised Transport Department; there must and can be no half measures, no compromising; and a stop must be put at once and for ever to our habitual "pennywise and pound foolish" policy; the difficulties must be faced and overcome in a systematic, thorough, straightforward manner, and officers and men must be selected for the service on account of their knowledge and aptitude rather than because they are desirous of obtaining medals and rewards; otherwise the result will be failure, and consequent disaster. To carry on war in Asia, or anywhere else, without properly organised Transport would be like making an omelette, without eggs, it *can* be done and *has* been done, but with what results?; and it is not surprising to find that all great Military authorities, including the Duke of Wellington, Napoleon, Sir Charles Napier, Sir Hugh Rose and Lord Napier of Magdala have frequently given it as their decided opinion that a regularly organised Transport Department is essential to the success of any great Military operation; if therefore we continue, as we do now to ignore the opinions of such men, to persistently refuse to profit by the experience gained in former wars, we sin with our eyes open, we court disaster.

Constantly and from every quarter, we are reminded and warned concerning our short comings, and no one will deny the truth of the following which is extracted from Colonel Little's translation of Alexander Kirchhammer's able review of the last campaign in Afghanistan

"England will have to acknowledge that the law of the struggle for "existence which imposes such burdens on the nations of the continent "is of inexorable universality, and she will be convinced, when it is too "late, that it is hopless to attempt to improvise in the hour of need an "organisation which other nations have laboured for the last century to "create with all the power of their minds, and the self denying capabili-"ties of their hearts.

"She will one-day come to the knowledge that nothing can "compensate for the want of military organisation."

The chief obstacles in the way of our military reform are, apathy and a peculiar sort of unwillingness to spend money until actually forced to do so, and these are, so to speak national qualities, notwithstanding the fact that millions are lavished yearly on comparatively useless objects. We comfort ourselves with the knowledge that some how or other we have almost always come out of our difficulties successfully and we therefore believe that there is no real necessity for spending a

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lot of money on working up an organisation which may perhaps never be required in our own time, and which we fondly imagine can easily be set going somehow when the necessity for it arises. We, the richest nation in the world, grudge the expenditure necessary to prepare in peace time a transport system which will serve us efficiently in war, notwithstanding that we see around us other nations, whose people though poorer than ourselves are embued with sufficient patriotism and wisdom, to enable them to appreciate the fact that, in the great struggle for existence, they must be always prepared to hold their own, or else be blotted out for ever. During peace time we cut down all establishments, allow everything to grow rusty, as it were, and continue in a happy state of semi-torpidity, every one being doubtless busily employed, but their work being entirely restricted to the ordinary routine work of peace time; suddenly, we find ourselves dragged into a war for which we have made no preparation, and then the nation rouses itself, and the money which was grudged before is poured out like water in the attempt to force on and extemporise what ought to have been carefully prepared beforehand and held in readiness. So it happened at the commencement of the last Afghan campaign, the result of which is known to the world at large. The country was traversed by railways and splendid roads, and full of transport animals but there was no organisation for the latter, and no military system for regulating the traffic on the former; the consequence was that the railway companies were put to their wits ends to meet the requisitions for troops and stores, and that when, through the indefatigable exertions of the Traffic Managers, these were disembarked at the two termini, there was a regular block; officers and men were worked off their legs and the distress and mortality amongst the native followers and transport animals were fearful; in fact the expenditure of life and money was so great and the general strain such, that few nations if any could have stood it.

Result of not being prepared for war with Afghanistan.

All this appears the more strange, for although heretofore the transport arrangements of the Indian army had been in the hands of the Commissariat department and had always sufficed for ordinary movements, yet we had received ample warning that war was imminent, and moreover systematically organised transport was not by any means a new idea in India, for we had all read of the famous baggage corps commanded by Major Maughan which was raised and organised by Sir Charles Napier G.C.B., for service in Scinde, and with reference to which he writes expressing his "conviction that without a baggage corps no "Indian army could manœuvre with rapidity and just power."— "Baggage corps means method and organisation instead of confusion, "and does not suit dishonest contractors * * * * "and would permit *public* animals being used for *private* purposes."— " * * * * "The officer commanding the baggage

Systematically organised transport not new in India.

Scinde Baggage Corps.

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"corps and his subalterns, all holding commissions, would protect alike "the baggage and the the public accounts. "Lord Gough complained "that his unwieldy baggage shackled his movements, which would not "have happened with a baggage corps."

"The baggage corps *has been disbanded by men knowing nothing "of war, but times will come to make men justly appreciate and "restore the corps in despite of the false notion that it is expensive.*"

Who can deny the truth or importance of those words which were written by a singularly able straightforward man who always meant what he said and who had the courage to say what he meant.

We had also read of the land transport corps which was employed for service in Persia in 1856-57, and which on the return of the expedition was broken up and the cattle distributed to stations in the Bombay presidency—and after this came the China War of 1860; then the Looshai and Duffla expeditions and the Abyssinian campaign, in all of which the transport was given a military organization, whereby the movements of troops and stores were rendered easy and regular while at the same time a great strain was taken off the Commissariat:

Persia 1856-57.

China 1860.
Looshai.
Duffla.
Abyssinia.

and lastly we have had before our eyes for many years the admirably practical arrangements of the Punjab frontier force, each regiment and battery of which has its own fixed establishment of transport animals to enable it to move in any direction at a few hours notice, carrying baggage, ammunition and 3 days supplies; and one regiment of which has for its motto "Ready aye ready," a singularly appropriate one which might be adopted by the whole force.

Punjab frontier force.

"A transport service for Asiatic warfare" is a subject which is not so easy to deal with fully and satisfactorily in the limited space allowed for an essay without jumping to many conclusions, and taking much for granted; and as India forms so large a part of Asia it may be asumed at starting that what is suitable for one part of the continent is, *mutatis mutandis*, suitable for any other part also. This subject must be divided into so many different headings, each of which has to be again subdivided, but broadly speaking we may take these headings to be.

Railways.
Metalled roads.
Unmetalled roads in the plains.
Do. do. in the hills.
Regimental or brigade transport.
Sick transport.
Commissariat and ordnance or general transport.

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We must however start with a few simple truths, which notwithstanding that they are sufficiently self evident, are yet unfortunately very often lost sight of.

1*st.* The description of transport must be adapted to the country, that is to say, to the roads and communications in that country, to the requirements of the troops acting therein, and to the description of food and forage procurable, as well as to the climate.

2*nd.* The details regarding organization, equipment, &c. must be worked out in peace time, so that on war breaking out every officer, man and animal will know where to go and what to do; and if this is properly carried out, each man confining himself to his own duties, and organisation and discipline be maintained in the transport department, there need be no friction with the commissariat, ordnance, or medical departments.

3*rd.* All officers, and if possible, most of the men and animals required for army transport purposes, should have had so much experience and training as to give them a thorough knowledge of the requirements of the service and the work that will be required from them; and if this is true—as I maintain it is—of the subordinate officers and men, how much more is it of the head of the department, and of the chiefs of divisions or branches immediately under him, who should and indeed *must* be all practical men, who have not only studied the subject theoretically but who have had actual experience in the field.

Railways.

Of late years India has progressed enormously in the matter of railway communications, the main lines being mostly of the same gauge, and in a short time we may expect to see Peshawar connected with Kurrachee, Bombay, and Calcutta which will enable us to concentrate troops rapidly at any threatened point of our frontier; but it will be within the memory of most of us how a few clever but bigotted men very nearly succeeded in causing a break of gauge at Lahore, which would have rendered that part, which is now known as the Northern State Railway, of comparatively little use as a military line; thanks however to the determined opposition and honest plain speaking of Lord Napier of Magdala, these designs were frustrated and we now have a military line of the greatest strategic value.

The enormous value to us of our lines of railway for military purposes has been amply demonstrated of late years; the rapid concentration of troops and stores at Bombay for the Malta expedition, and again at Jhelum and Sukkur for the past and present wars in Afghanistan, clearly prove the truth of what has been so often asserted, viz. that railways rank first in importance in any transport system either for European or Asiatic warfare.

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In order however to derive full benefit, in a military point of view, from our rail-roads in India we *must* work them systematically and avoid anything like hurry or confusion. The sizes of our trains and the strength of each unit to be carried at one time have all been fixed and clearly laid down, but the most important part of all has as yet been omitted, viz. the preparation and publication of military time tables for regulating the running of troop trains on one and the same system throughout India; this is no new idea of my own for it has been advocated for years past by Lieutenant Colonel Collett, Major Le. Messurier, R.E. and many others; and Mr. David Ross, the energetic Traffic Manager of the Sind Punjab and Delhi Railway worked out a simple set of tables, which any one but a fool could understand and which contain every thing that is wanted. In short if we wish for regularity and success in our military movements we must start fair with a regular systematic railway service, and as no system can be improvised on the spur of the moment, it stands to reason that the necessary arrangements should be made and understood by all concerned beforehand.

System required in working.

How could the ordinary daily traffic of a railroad be carried on without time tables? And yet it is well known and acknowledged that such tables are even of greater importance for special movements of large bodies of troops.

Recognizing as we do the indisputable value of railroads to the transport service in war time we yet take no steps whatever towards constructing works for protecting any of the large bridges or junctions, or for laying down rules for patrolling the lines or preventing them from being broken up or injured.

Protective works required.

No system of transport of any description for an army in the field can be considered safe and reliable or even satisfactory, if the lines of communication along which it is worked are not properly secured, and as of these lines the railroads are the most easily vulnerable, more especial care should be taken for their protection.

Each terminus should of course be provided with any amount of sidings and platforms, the latter being raised to such a height as to be within six inches of the level of the floor of the railway trucks and carriages, so as to allow of the thickness of a strong loading board or flap door; the platforms should be all ramped at both ends and on the side furthest from the rail; and should be metalled; one or two roads should lead from each platform to selected grounds which should be levelled and prepared for the erection of sheds for stores, or for camping grounds for troops, followers, horses or cattle, and these grounds should be all separate and distinct from each other.

Terminal arrangements.

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Two or three platform cranes should be *always* kept at each terminus, and it would be advisable also to have a few *light, strong* hand-carts or truckes on two wheels so as to assist in removing baggage and stores to the sheds and camps. The engine water supply should be within the defensive works, but well out of the way, so as not to interfere with the traffic or with any additional lines or sidings that may be required hereafter.

Immediately on war breaking out or concentration of troops being ordered, an *experienced* officer of rank should be sent up and appointed commandant of the railway station and the surrounding camps. He should have a small staff of officers and men; he should be furnished with instructions (prepared before hand) on all points connected with his special duties, and he should be at once supplied with entrenching tools, railway lanterns, &c., and a treasure chest so as to enable him to make all necessary arrangements for sanitation, sheds, platform approaches, &c. At the same time a fixed number of British sodiers, *who had previously undergone a special training*, should be sent up—the station being for the time the operations last under military control—to assist the regular railway staff working the telegraph, railway yard, and traffic generally.

All these may appear to be matters of detail of very minor importance, which can be all arranged for on the moment, and some people may even go so far as to call them irrelevant, but I venture to state that such is not the case, each and all of them are so intimately connected with the efficient working of our army transport that the omission of any one of them would certainly cause confusion, and a block of some sort; they are simply like links in a chain, each one must be there, in its right place and perfect in itself.

The railway systems in Germany and France are nearly perfect and the Russians are improving their's every day; the latter nation bought their experience dearly, for Greene in his account of the Russo-Turkish War, when describing the concentration of the Russian army in Roumania tells us that the railroad was totally unequal to the task that was demanded of it, for it was a single track with a small quantity of rolling stock, and insufficient terminal facilities in the way of switches and sidings. Moreover the gauge of the Russian railway being 5 feet while that of the Roumanian line was 4 feet 8½ inches, necessitated a complete transfer of freight and passengers at Yassy and increased their difficulties considerably.

Metalled roads.

The railway must of course stop some distance short of the scene of operations, so after leaving it the troops and stores, &c., must take the road, and it is probable that the first portion will be metalled, but however, this may be, the protection of the road by means of armed posts, well placed and fortified, or by patrolling, or both combined, must be the chief care of the general in command.

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Unmetalled roads.

Stores, baggage, &c., are carried either in wheeled conveyances of some sort, or on pack animals, and as long as the roads—be they metalled or not—are fit for carts to travel they *alone* should be used, and no pack animals (except those belonging specially to regiments which will be treated of hereafter) should be allowed to work on them.

Our roads in the plains of India are perhaps the finest in the world and yet what use do we make of them?

No object can possibly be gained by employing pack transport along lines of roads which are at all times easily passable by wheeled conveyances, but on the contrary there is an immense and useless waste of power, time, animal life and public money; and yet every year, every day we see it going on; look at one of our regiments on the line of march in India during peace time with its long strings of laden camels, every one of which might be drawing a cart containing four times its packload. (See "carts" further on). Anyhow whatever means of conveyance is made use of the roads are kept up just the same.

The army transport of other European nations consists almost entirely of waggons and carts; the only change that has occurred during the past few years has been in France where by a ministerial decision of last September one of the two carts employed in carrying entrenching tools was suppressed, and a pack animal for each company was substituted. It is worthy of notice here that Turkey is the only other nation that employs pack animals for the conveyance of entrenching tools, 20 shovels and 5 picks per company being carried in this way.

As however, when engaged in Asiatic warfare most of our fighting has to be done in the hills where roads passable by wheeled transport are few and far between, and as it is absolutely necessary that certain articles which are required by the troops should accompany them wherever they go, the means of transport made use of for this purpose being suitable to the country in which the operations are being conducted, it follows as a matter of course that from the point where the roads become passible only with great difficulty, coolie or pack transport must be employed.

With roads from Jhelum to Thull in one direction and to Jellalabad in another, over which two-wheeled carts carrying mails and passengers, can he driven with comparative ease and safety, there is no reason why a single pack animal should be employed for the conveyance of stores, clothing, camp equipage, &c., until after passing those two places.

General Gourko, the first time he crossed the Balkans left all his wheeled transport at Tirnova and took with him only pack animals, carrying 5 days' rations of bread and 3 days' of forage; Artillery was certainly taken, but the guns were dragged by the infantry over the

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greater part of the road. On returning to Tirnova he took up his regular transport again.

Since the destruction of the camels that were sent with the Bengal columns along the Kandahar line, that road has been worked by wheeled transport, on the staging system in the most thoroughly efficient and satisfactory manner. This appears to be due almost entirely to the energy and forethought of General Phayre and Sir Richard Temple, actively assisted by the Bombay civil and commissariat departments. It is not denied that the construction of the carts thus employed is of course capable of considerable improvement, but they were the best obtainable at the time and they have answered their purpose fully.

Transport generally.

Generally speaking then army transport of all sorts may be divided into:—

1. Wheeled transport.
2. Pack transport.

For service in India or the more northern part of Asia both are required, and if we desire that our army should be a really efficient fighting machine, capable of moving anywhere as occasion demands, we must pay special attention to the mobility of each regiment, and the only manner in which this capability to move at short notice can be attained is by having always actually with each regiment a certain quantity of motive power in the shape of regimental carts and pack animals, the exact numbers of each being regulated according to the part of the country in which the corps is located and the particular work which it may be called upon to do. For instance a regiment stationed in the hills would only have pack animals with it, while one in the plains would have a certain number of carts as well. A portion of the balance required to move each regiment would be best kept at brigade or division head quarters, and the remainder, including most of the sick ftransport, at head quarters of the division or army corps. The exact proportions to be kept with each would of course be laid down by those who are competent to do so, and whose duty it would be, and would as I said before be regulated according to circumstances, as it would be manifestly absurd to lay down hard and fast rules on this subject and make them applicable to all alike. It may be argued that this is all superfluous as there is plenty of movable column carriage kept up throughout the country, and if more is required it can be supplied easily and quickly by the civil and commissariat authorities; and I do not attempt to deny, for there is scattered about from one end of India to another at 24 different stations, on the Bengal side alone sufficient recognised movable column transport to move a force aggregating

Regimental.

Brigade.

Divisional.

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12 Batteries.
8 Squadrons British Cavalry.
12 Do. Native Cavalry.
12 Battalions British Infantry.
17 Do. Native Infantry.

the strength in troops and carriage for each station being distinctly laid down; and according to the old ideas the plan might perhaps have been suitable to the times; but however that may be, times and conditions have changed very much of late years and we *must* change with them.

The chief use to which this movable column carriage is put, is to assist in carrying the baggage of troops, marching in relief from one station to another, consequently at all stations situated on or near the great lines of communication. This carriage being at graze all summer and employed marching all winter, is never available for the exercise of the troops that have been told off to the columns, consequently at most of these stations the troops never were able to move out, and neither officers nor men knew their places, nor in fact, any thing connected with what their duties or requirements would be if the column was suddenly ordered out. Moreover I never knew a station in the plains at which this column carriage could be collected under three days time, and even then, being composed chiefly of pack camels or elephants it was only suitable for slow movements, and could not have been transported by rail without difficulty and further loss of time. As for our British regiments located in the hills, many of them never moved out on the hill side for even a single day, and whenever in exceptional cases, such as the 1st Battalion, 8th "Kings" at Chukrata, officers and men took a pride in perfecting themselves in the theory of hill warfare, the most they could do was to practice manœuvres extending over one day only, as they were always obliged to return to barracks the same night owing to want of carriage; thus they lost in a very great measure the benefit of a residence in the hills.

My idea of a movable column is that it should be composed of troops able to march at 24 hours' notice at the most, with ammunition and provisions for three days, and in that way, I think, that the system pursued in the Punjab Frontier Force is most excellent. The two regiments of this force that are located at Abbottabad have 100 mules each, *because the country there is not suitable for camels;* the Corps of Guides (a special organization) has only mules and yaboos with Kabul "Pulan" equipment, but each other regiment of Infantry has 40 mules and 55 camels attached to it as regimental transport. The mules are kept always with the regiment, but the camels of course have to be sent out to graze. The four batteries of mountain artillery have their baggage animals also always with them, irrespective of the grass cutters' ponies; and the cavalry have means of transport in themselves for everything except ammunition. So here we have a force consisting of

4 Mountain batteries.
5 Regiments of cavalry.

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The Corps of Guides.
11 Regiments of Infantry.

each and all of which are supplied with just sufficient carriage to enable them to march on service lightly equiped at a few hours notice.

There is every reason why the greater part of the regular army throughout India should be as efficiently mobile as are those regiments of the Punjab Frontier Force, but this can only be attained by applying the regimental transport system that obtains among the latter, modified according to circumstances, to most if not all of the regiments, British as well as Native.

The advantages of having such regular regimental carriage are many and great and have during these last two campaigns become sufficiently obvious to all, there is therefore no necessity to enumerate them all here; suffice it to say that under such a system we can move an army corps at any time and in any direction at a few hours' notice, each regiment of which is independently mobile having its own organised and disciplined transport, the loading and working of which is thoroughly well known and understood by every officer, non-commissioned officer and private.

It would be for wiser and more experienced heads than mine to determine how many, if any, corps should be kept up with full transport, how many with a reduced establishment and how many with none at all; also how much of this should be pack and how much on wheels; the *system* however must be the same throughout.

That such a radical change as the universal introduction of disciplined regimental and brigade transport throughout the greater part of India will be expensive is not denied; cheapness in military establishments is not and never can be compatible with efficiency; but I think that this national bugbear "expense" has been overestimated a good deal. I have not the means at hand, nor time, nor space to go carefully into calculations on this head, but I feel sure that considerable reductions could be made in the commissariat department, and that the saving in the keep and feed of the large numbers of elephants that could be reduced, would be considerable, and that the cost of moving troops by route march in the regular course of relief would be lessened by probably one-half. But however this may be, I maintain that the first and chief point to be gained is the efficient mobility of our troops, the cost of which should be quite a secondary consideration; that the only possible way of obtaining this is by having a sufficiency of organised disciplined transport, supplementing a carefully considered and well regulated military railway system; that such transport can only be so organised regimentally or in large bodies by brigades or divisions or by a happy combination of both; and that such a system would actually be cheaper in the long run than the one which has been in force for so many years, and which, being unable to bear the strain of extensive and

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extended operations has completely broken down at the very time it was most wanted and it is to be hoped finally collapsed, after having caused the destruction of over 50,000 camels alone, besides thousands of other animals, not to speak of soldiers and camp followers, the expenditure of vast sums of money and an enormous strain on the country occasioned by an inability to strike crushing blows with concentrated forces at the commencement of the war, the consequent prolongation of hostilities, and the probable loss of prestige.

Employment of regimental transport in peace time.

The efficiency and utility of transport animals is much impaired by keeping them standing idle in their lines from morning to night, therefore for this reason as well as from motives of economy it is desirable that they should all be employed as much as possible, and this can be done to a certain extent regimentally in cantonments in various ways; in carrying water about the lines, thus enabling the puckal bullocks and a certain number of bheesties to be dispensed with; in carrying rations for the men, and grain for the horses, from the commissariat yards to the lines; in carting away stable litter, &c., in carrying the bedding and kits of such station guards as are changed daily; in carrying commissariat, ordnance and regimental stores, or the baggage of troops to and from railway stations; in carrying furniture, building materials for the Public Works Department, &c., &c; and a certain number would also be taken out on every ordinary parade carrying ammunition boxes and entrenching tools; and on "marching order" parades, field firing exercises, or field manœuvres they would carry kits, tents, cooking pots and rations according to requirements; whilst during the cold weather the standing brigade or general transport would be employed with troops marching in relief.

It may and probably will be urged by some that there is no room for transport lines in the vicinity of barracks, and that even if there were, they could not be so placed on sanitary grounds, but such excuses are not really tenable for an instant; one officer in each regiment (in British regiments *not* the Quarter Master) would be placed in charge of the whole regimental transport, receiving a small addition to his pay, and he would be responsible to his commanding officer *alone* for every thing connected with it; the animals' lines, gear and equipment would be Government property, and the establishment, repairs, &c. would be paid for by Government in the usual manner.

The proportion of pack animals and carts proposed for each branch of the service will be noticed further on.

Equipment for men.

The equipment of the men and animals is a matter that requires careful consideration. Each man—whether belonging to regimental or general transport—should have one uniform dress, which I would propose should consist of

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1 pair loose trousers.
1 loose coat or "jumper," (both made of stout drill.)
1 puggree or turban.
1 waded coat or "meerzai" for winter.
1 pair puttees.

All of these to be of one and the same colour, khakee or dark blue—the latter for choice, as being more easily distinguishable on all occasions, requiring less washing, and being less liable to change colour, and having the number or letter of the corps or branch to which he belongs marked distinctly upon one arm. In addition to these I would give him one pair of native shoes, which with the clothing above mentioned would be issued annually under regimental or departmental arrangements, and a stout haversack, issued every two or three years. Besides all these one short curved sword and one strong leather shoulder-belt with frog should be kept in store for each man, to be cleaned and looked after by certain selected men, and only to be issued when proceeding on service, and occasionally for inspections. It would also appear advisable to ensure that each man should always have a good "lota" with a length of line attached. These appear to be all the requirements for ordinary times; special issues of blankets, water-proof sheets, &c. for service beyond the frontier would be made in accordance with the rules now in force for camp followers and which it is unnecessary to specify here.

For animals.

The equipment of the animals depends of course chiefly on the work in which they will be employed, and also a good deal on the amount of superintendence and the care that is taken of them.

Elephants.

Elephants I would do away with for transport purposes, except in such places where their services are *actually necessary*; it will be always necessary to retain from 12 to 20 of these animals at or near Peshawur, in addition to those employed in the heavy field batteries, for carrying light field guns required to accompany an expedition into those parts of the hills where no good roads exist; the present equipment is not very suitable and leaves a good deal to be desired; it being heavy and cumbersome, and liable to produce sore backs when the loads are heavy and the marching prolonged.

Camels.

There is no apparent reason why these animals should be only used in carrying loads, considering that they can also be equally well used for draught purposes, so long as roads are fairly good, and for service with troops marching along the splendid metalled roads of India it seems to me a waste of power to employ them only as pack animals. Camel carriages and carts are in use in various parts of India especially in the Meerut, Agra, Delhi and Muttra districts, where they can be seen working all the year round in large numbers carrying passengers and goods of all sorts. These carts are

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all mounted on four wheels, are long and low, and clumsily constructed; they are of two sizes, the smaller being drawn by one camel, will carry on an average.

14 passengers, or
21 maunds of goods.

The larger and stronger drawn by two camels harnessed abreast carry

14 passengers, or
28 maunds of goods.

The pace is exactly the same as when laden. So if we consider that the regulation load for one camel is 5 maunds only, the economy of using them in draught becomes at once apparent (see also "Carts" further on).

For ordinary pack purposes the common country equipment which is in general use cannot well be improved upon.

For the carriage of sick the camel is fairly well suited, the main difficulty being the kujawah, cradle or chair, the correct shape, size and weight of which can only be decided by actual experiment in hills as well as plains and under varying conditions. One point however seems clear, viz. that they should combine lightness with strength, so that the weight of two sick men with their kits and arms should not exceed 5 maunds, it being extremely undesirable to separate the men from either their arms or personal baggage *when on service*. Several descriptions are under trial now in the field and so we may expect that this important point will be finally settled before long.

Mules and ponies.

The small variation in structure between these two descriptions of animals renders the mule slightly preferable for carrying loads, while the pony has the advantage in draught, but for all practical purposes they may be considered together, some perference being given to the mule as being hardier, less liable to disease or sore backs, and of denser bone.

They can also be equally well used in draught as in pack, the former will be considered more fully under the heading "Carts" further on.

Saddles or pads.

As regards the equipment of pack mules or ponies, opinions are divided as to whether this should consist of regular pack saddles, or of a somewhat improved combination of the ordinary country gear and a pair of leather covered pads; many practical men of great experience advocate the former and just as many equally good and experienced men, the latter; and these last have so much in their favor that the present ordinary gear of the country has stood successfully the test of centuries, is thoroughly understood by the natives, seldom requires any repairs and is cheap, light, strong, and effective in every respect. Having had

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considerable experience with pack animals, I state without fear of correction that both are right; but if I were given a miscellaneous assortment of animals with which to do an unlimited amount of work at short notice and extending over an unknown period of time, in rough country, with inexperienced officers, subordinates and drivers, I would without a moment's hesitation adopt the equipment which was recommended by Colonel Le Messurier's committee and which is in more or less general use now along our lines of communication. Anything more simple, serviceable, or cheaper than this equipment it is hard to imagine; and still there are many officers and men who have been serving in the transport trains for the last six months, who are either so ignorant or so careless that they constantly *even now* allow baggage animals to start loaded on a journey improperly saddled, without anything under the 'soondkha,' or with the different parts so put on as to *ensure* a sore back or a gall before the march is half done. This is a notorious fact, and if allowed to continue much longer unchecked, must bring discredit on that style of equipment; but unfortunately it by no means follows as a matter of course that the responsible parties will be blamed.

Under proper regimental arrangements, with careful supervision a good style of pack *saddle* will always answer well, as may be seen any day and with any infantry regiment in the Punjab Frontier Force; but I fail myself to see that any saddle yet invented possesses one single advantage over the pad and soondkha equipment, while it is heavier, more expensive, more liable to damage and affords less protection to the animal. One thing must be borne in mind, that a bad selection costs as much as a good one, whilst at the same time it does incalculable harm in many ways, injures the animals, delays the transport, &c.

Lieutenant Colonel Parsons in his able lecture on transport, delivered at the United Service Institution, Whitehall, hits the right nail on the head when he says that "it is often advisable to adhere to equipment "to which the animals and owners have been accustomed and which "has doubtless been found suitable to the country from which they have "been obtained."

Mule breeding.

The general run of mules in India are small and light, and as it is now a recognized fact that good mules are essential to efficient transport for Asiatic warfare, especially when the operations are carried on in hilly countries, one of the first steps that should be taken is to establish mule-breeding studs at different places in the three presidencies, and to encourage the breeding of good animals generally throughout India for pack purposes as well as for draught. Something, has no doubt been done in this way; a few good donkeys have been imported for the purpose, and prizes are offered at some of the horse fairs, not to mention the large prices that are paid for any animals that are above the average in size or quality; but these have failed to produce the stamp of animal required for service in sufficient numbers, and much more remains to be done. Money

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must be expended, a regular system *must* be introduced and carefully worked, and all stallion donkeys of small size and inferior breed should be castrated. This will not only improve the mules but the breed of donkeys too, and the whole country as well as the army will benefit greatly thereby.

Donkeys.

Donkeys are useful hardy animals, and many of them have been, and are still being used for army transport, but they are too small. Their equipment should be similar to that advocated here for mules and ponies.

Bullocks.

Bullocks are the ordinary draught animals employed throughout India and in many parts of the country the small breeds are used for pack carriage; some hundreds being now, so employed in Kurram and in the Khyber. In the Madras Presidency they are frequently used for army transport, being invariably hired for this purpose, they are surefooted, strong and easily managed, but are slow, suffer much from cold and are liable to become footsore when used over rough ground. An ordinary Madras pack bullock carries 2 maunds of grain, or a native tent complete, but without poles, weighing 123lbs.

Under the present system in the Madras Presidency the elephants, camels and mules are I believe never hired, but are the property of Government.

Carts.

We have it on the highest authority that from an economical point of view wheeled transport is far superior to pack animals of any description, and there is no doubt of the truth of that statement. At the same time it must be borne in mind that the description of vehicles so employed must be suitable to the roads over which they have to travel, to the work required of them, and above all to the size and strength of the animals to be used in them. In England, and on the continent, in America and in Africa wheeled transport is almost entirely employed for army purposes; this consists, of trains of large waggons and carts drawn by large heavy horses; bullocks are employed in Africa, but we have the authority of Sir Garnet Wolsely for saying that all the army service carts used in England are so heavy that, even unloaded, they are a good pull for a single horse.

In India we have but few horses that could be spared for transport draught purposes, the only animals that could be so employed are ponies, small mules and bullocks, the latter we will leave out of the question for the present, therefore we require small, light, strong carts, well and carefully constructed, so as to combine the greatest possible carrying capacity with the least amount of strain and distress to the animal. Carts can of course always follow wherever Horse Artillery can go, but it is perhaps undesirable that they should do so in *all* cases.

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Throughout the whole of India proper, and in many cases beyond the border and even in the hills where fair roads exist, carts should always be used, and their extended employment would not only result in a great saving in money, animals and labour, but give more satisfactory results generally.

Take for instance the immense number of troops that have marched from Jhelum to Peshawar and back during the last two campaigns, some of their baggage being carried in common country bullock carts, and the rest on camels. How much more satisfactory would it have been to all concerned if it has been all carried in good carts, either camel, bullock or mule, worked on the staging system, the animals and not the carts being changed daily. Look again at the long strings of laden camels that follow a regiment marching in the ordinary course of relief in peace time, and say if it would not be more economical and better in every way to employ a quarter of the number of animals and to carry the tents and baggage in good carts. I have touched on the subject of camel carts before, and shewn how economical and efficient they are as means of transport along good roads, even when ill-constructed and badly looked after.

That the ordinary bullock hackery or cart of the country can be very much improved was proved by the late Colonel Soady, Royal Artillery who had one made up in his own battery workshops, which he invariably used on the march or when moving about the district that cart was lighter, stronger, more easily drawn and of far greater carrying capacity than any country-made one I ever saw.

Necessary qualities of carts.

As I said before, carts should be suitable to the country, the work and the animals, they require strength combined with lightness, portability, facilities of loading and unloading, economy in cost, and adaptation to the description of loads to be carried; they should not only be so constructed as to be capable of being safely worked over good metalled roads, but should be strong enough to resist violent shocks, and the ordinary accidents met with in a campaign, they should be of such dimensions, and so mechanically arranged as to admit of their use on all cross-country roads in the plains of India, as well as on the rough and steep roads in the hills; it is therefore manifestly undesirable that such army transport carts should have springs of any sort attached to them as *permanent fixtures*.

The lighter the vehicle, consistent with durability, the less will be the distress and injury to the animals, and the greater the regularity with which the service will be performed. To combine lightness with sufficient strength and accommodation is of course a difficult matter, it being remembered that on rough roads the greater the weight the greater the violence of shock. I am, however, informed by Messrs. Bradley and Co., of Allahabad that they are prepared to make such carts

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suitable for single mules, ponies or bullocks as will answer every requirement. A description of this cart is given in the appendix and I would recommend a trial being made of them.

Unwieldiness and overweight are serious evils in a vehicle, the very nature of which requires that it should be easily handled, easily packed in trains or an boardship, and readily moved over all sorts of ground and in all weathers, with a sufficient regularity of pace.

Economy dictates the rule that the capacity of a vehicle should be in proportion to the draught power attached to it, consistently with other requisites; moreover the load which an animal is able to draw is greatly influenced by two conditions, viz. the rate of speed at which he is required to proceed, and the amount of friction between the wheels and the ground over which it is drawn: this latter condition depending greatly on the size of the wheels, for the larger they are, other things being equal, the less the friction and the easier the draught.

Again speed can never be an object in transport so much as regularity, therefore the shafts, wheels and axles should be in proportion to the work of the cart; the tires being broad so that they will cut less deeply into heavy roads, be less liable to stick and create a stoppage, and that they may add to the stability of the vehicle; the length of axle or rather the breadth of the wheel track being the same as that of the average run of country carts, ekkahs, &c., so that the carts may run with ease over all unmetalled cross country roads without that jolting and straining so injurious to the vehicle, the animal and the load and which cannot be avoided if the wheels are not made so as to run in the old ruts.

The small carts, that we require, should be drawn by one animal working in the shafts and attached by breast harness, but the splinter bar should always be so arranged that in case of necessity another one can be hooked in. One beast acting independantly will exert his whole strength, and if necessary one driver can then take charge of a string of several carts, the animal being fastened by a rope or rein to the tail board of the cart next in front; and further the animal should be led and not driven, thus the expenditure of power in carrrying the extra weight of the driver is saved.

They should have strong sides and a removable door at the back; they should have nothing superfluous in the shape of springs or tops, unless separate vehicles of this size and description are considered advisable for the carriage of sick—two men lying down or four men sitting—then of course they would have both.

Each transport cart should always carry the following articles, 1 spare trace, 1 felling axe and 1 pick axe, strapped on outside on one side, and 2 phowrahs with 2 spare helves on the other; 1 small drag rope fastened in front; 2 small boxes fixed underneath, one containing grease composition and the other a spare linch pin and washer, "S"

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hook, shoemaker's awl, thread &c., hammer and a few strong nails; 1 drag either "roller" or "shoe" pattern.

If the mule or pony is equipped with a regulation pack saddle or pad, no traces will be required, but merely a broad leather band between the shafts to fit over the saddle and fastened by a girth.

The English cart-horse.

Youatt tells us that the average work done by an English cart-horse acting singly, under which conditions he will best exert his powers, is from 8 to 10 hours a day for 6 days in the week, the pace varying from 2½ to 3 miles an hour, and that the weight which he pulls rarely exceeds 24 cwt. besides the cart, which is perhaps 8 or 10 cwt. more; and again we read in McAdam's treatise on road making, that a well formed English cart-horse of 15½ hands high can draw 25 cwt over any hard road, indepedent of the weight of the cart, which should not exceed 7 cwt.

Such calculations are of course not applicable to a transport train in India the animals for which must necessarily be chiefly small mules or ponies, but they may be employed to ground calculation upon.

Carts used during the present campaign.

Hackeries.

Let us see now what wheeled transport has been used during the present campaign. First come the common two wheeled country bullock-carts which have been employed in large numbers wherever or whenever they could be got. The average load of the 4 bullock cart is 60 maunds and that of the 2 bullock cart is 30 maunds; each animal drawing about five times what he could carry; the average width of wheel track of both is the same, *i. e.* 4 feet 4 inches, outside measurement.

Government Bullock Train.

Then come the capacious, but clumsy and heavy Government Bullock Train carts, which, notwithstanding the great murrain amongst the cattle last year, has simply done wonders in the transport of grain and stores of all sorts; and I attribute this really great success entirely to the fact that this service is and always has been thoroughly well *organised* and worked on a regular system, which besides being suitable to the country and its requirements is capable of expansion without trouble or confusion.

Bankipore carts.

These carts so called from the district in which they are chiefly made, are of peculiar construction, and combining, as they do, stability with strength and lightness are very suitable for rough work, but they are only intended for bullock draught. Large sums of money were expended on the purchase of these carts, and on transporting them by rail to Jhelum, after which three of them were sent on to Peshawar to be reported on; the remainder are lying at Jhelum at the time this is writen, but what will become of them hereafter I know not.

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They require bullocks for draught, the average carrying capacity is from 20 to 25 maunds of grain or compact goods, the outside wheel track is 4 feet 5 inches.

Ekkas.

We are all or most of us familiar with the common ekka of the Punjab which is similar in construction though slightly larger than those in use lower down country; these primitive looking vehicles, though small, will carry a load of men, or 4 to 5 maunds in weight of grain or baggage, together with the driver for long distances, at a fair pace every day for an indefinite time, the country bred ponies of about 13-2 or 13-3 hands high never seeming to tire and the same animal going from one end of the journey to the other. The height of wheels averages about 3 feet 6 inches and the average outside measurement of wheel track is 4 feet 3 inches.

Several of these have been employed with great advantage in the Kuram Valley under the orders of General Watson C.B.,V.C.; and the fact that it was necessary to use such vehicles in army transport, only proves what I have all along contended for, viz. that small light strong carts are what we require.

Ekkas answer well for good level roads, but are unsuited for very rough or hilly country as from their instability they are liable to capsize.

Bombay carts.

After the destruction of the camels on the Kandahar line, the transport was worked by means of carts which the energetic Governor of Bombay caused to be made and sent up in hundreds, and which were at once set to work on the staging system, which was carefully organised by General Phayre. The carts appear to have been chiefly of three patterns, viz. the ordinary country, the Bombay municipal, and the so called Maltese—all were drawn by bullocks supplied from Scinde, and the celerity and regularity with which the supplies of food, stores and clothing were poured into Quetta amply testifies to the efficiency of their organisation, as well as, to the talents and energy of the organiser.

Large numbers of carts were at first made of green wood, and of course broke down quickly.

On the line of communications in the Bolan pass on the 1st August 1879, there were of municipal and Maltese carts

383 fit for service.
622 broken.

The Bomday Government is prepared, if necessary to run bullock carts right through to Kandahar.*

* Since this essay was written large trains of carts drawn by two bullocks each, have been constantly taken right through from Pir Chowkey to Kandahar. M. J. K. H.

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Maltese carts.

At the first cry out for carts of some sort, some one suggested having them made up by hundreds on the pattern known now as the Maltese cart, which was strongly recommended as having been used for transport in Abyssinia. No one seemed to think for a moment what the size weight or capabilities of these carts were or whether they were suitable to the roads, animals and men of the country; so the order went forth; 400 were made up in no time at Bombay for the Bolan route, each cart weighing 765lbs. or nearly 7 cwt. and costing Rs. 175; subsequently many of these were transferred to the Kurrum and Khyber lines; numbers of these were also I believe made up at the gun carriage factory and at other places; but they were reported to be unfit for mule draught—and no wonder.

Of course carts of sizes are used in Malta according to the size of the animals employed, but out in India we seem to have been seized with the idea that there is one size and one pattern only and this has been strictly adhered to; the dimensions are

Height of wheel	5 feet.
Outside width of wheel track ...	5 feet 5 inches.
Width of tire	3 inches.
Thickness of felloes	3 inches.
Height of floor above ground ...	41½ inches
Width between shafts, at splinder bar ...	29 inches.
Length of actual shaft	61 inches.
Weight empty	765lb.

They are strong, heavy platform carts, not very suitable I think even for large horses or mules 15 or 16 hands high or a pair of large bullocks, but utterly unsuited in every way for small mules or ponies, for the carriage of tents or stores and for the purposes or requirements of Asiatic warfare generally.

In Abyssinia these carts were employed in the Lowland train, working between the sea coast and Senafé, and were drawn by two large Spanish mules to each.

For ponies.

Lately a few small carts on this pattern suitable for ponies or mules were made up at Peshawar for trial, and they worked well through the Khyber, carrying fair loads; but at the time this is written, April 1880, they had been ordered to be discontinued on *account of the expense* of making them, viz. 80 or 90 rupees each.

We have seen hundreds of inferior mules and ponies incapable of carrying a greater weight than 2 maunds, purchased without grumbling for 150 and 200 rupees for the transport department, but they grudge 90 rupees for a cart which will carry much more. Curiously enough

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some enterprizing natives have started a few carts of this description that are plying along the Grand Trunk Road between Jhelum and Peshawar. They are very roughly made with lowwheels, and the one miserable pony has to go right through from end to end, but they work well and carry loads varying from 5 to 15 maunds.*

Army service carts in England.

Amongst the recognised military carriages in use in England the only two which appear to most nearly answer our requirements for transport in the East are the siege equipment trench cart and the siege hand cart, the former having wheels 4′ 2″ in diameter and track of 4′ 3½″, weighs 7 cwt. and is capable of carrying a load of 1½ tons; the latter is of lighter construction with wheels 4′ 2″ in diameter, and a track of 4′ 5½″; weighs 4¾ cwt. and carries a load of 15 cwt.; it is fitted with shafts and has 2 slats issued with it for man draught.

Roval Engineers cart in the Khyber.

Through the kindness of Lieutenant Blunt, Roya! Engineer, I am enabled here to give a description of a light equipment cart which was designed and made at Roorkee for service in the Khyber, several of which were in use during the late operations. This cart is highly spoken of by the officers of the corps.

Height of wheels	4	feet.
Outside width of track	4	feet 7 inches.
Inside dimensions of cart ...	5	feet 5 in. × 3 ft 3 in.
Height of side of „ ...	1	feet 2½ inches.
Bottom of platform transom above axle ...	8½	inches.
Weight empty	10	maunds.
Weight of load	10	maunds.

Fitted with pole and yoke for 2 bullocks and strong springs; cost Rs. 200 at Roorkee, Engineers' workshops.

It seems strange that at the time the Royal Engineers were making up carts for use on service, regiments of British cavalry were actually leaving their regulation regimental carts behind them in cantonments.

Proposed Indian transport.

Assuming that the organisation of military transport in India, is to be entirely of a military character, worked by one transport department, entirely separated from the Commissariat, and under the control of one man as superintendent or Controller General, who is answerable for the state of the transport throughout all India to the Commander-

* Major Heyland of the 1st Bombay Lancers has invented a small pony cart which was highly approved of by Sir Richard Temple and which is well worthy the attention of Government. M. J. K. H.

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in-Chief or Governor General alone, and this I believe to be a "sine qua non" if it is to work smoothly and efficiently in time of war; and assuming also that the army in India will for the future be divided into army corps. I consider that the transport consisting of both carts and pack animals should be so allotted that each battery and regiment should have its fixed allowance at all times, the description and numbers of which must be in proportion to the strength of the corps and its liability to be ordered out on service, besides being suitable to the requirements of the men and the nature of the country; capable of being completed at once to a war scale from the brigade or divisional transport columns; and that at some selected station in each army corps command should be permanently located a reserve for General Transport; each of these three having a fixed establishment of officers, men and artificers in the same proportions as are now allowed for the transport trains working on the Khyber-Kabul line (see Appendix II.)

The close of the operations in Afghanistan will offer an opportunity such as we may not expect to occur again, of forming a regular serviceable and complete transport corps second to none in the world, and at comparatively little expense, for the animals having been purchased, are already the property of Government, and of these the mules and ponies instead of being sold, for paltry sums, in order to form, an insignificent item on the credit side of the Commissariat account books, should, and I trust will be, distributed as they are, in equal proportions to regiments, and batteries throughout India as far as they will go, taking care to complete the requirements of the most northern army corps first with regimental, division and general transport. Some regiments are now busy purchasing baggage animals for their equipment as part of the Bengal *2nd Reserve Division, and these animals should be retained by them until replaced by others of a better stamp. Officers serving in General Transport should be seconded in their regiments, and, relieved every 3 or 5 years.

Everything should be kept at the lowest during peace time compatible with efficiency; it will also be necessary that the general commanding each army corps should possess such intimate knowledge of the resources of the country included in his command, in men, vehicles and animals, as will enable him to fill up vacancies and complete requirements at short notice.

As models of what army transport should be, so far as organization and general working arrangements, rules and regulations are concerned, I would beg to refer to the French system, Appendix I, and to the Khyber-Kabul regulations, Appendix II; and as an example of what real good work a thoroughly well organised transport is capable of performing, I would point to the Abyssinian campaign of which we all have read (see Appendix III.)

* These have since been ordered to be made over to the commissariat department.

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Regimental.

Sir W. Napier K.C.B., in his book "Life of Sir Charles Napier" speaking of the Crimean land transport corps says, "it has not yet embraced the personal bag-"gage of regiments, and is therefore only a half measure of the Gov-"ernment, wanting that vital part of the scheme."

Regimental transport is the foundation or the first link in the chain; every other military nation regards it as such, and we are now actually working on that system.

No transport, however, can be worked without system and order; therefore it is necessary that one system and one only should exist throughout the army, and that commanding officers should be held responsible that it is fully carried out and the rules strictly obeyed.

Baggage.

Every officer and man should always have in his possession such articles of clothing and equipment as he will require on service, and the ony way to ensure this is to *fix by regulation* what these should mainly consist of, without going into actual details; this has been done for the rank and file but not for the officers.

Officer equipment.

My own idea, assuming that 80 lbs. only of baggage will be allowed on service is that *each* officer should be *obliged* to provide himself with a pair of small mule boxes made of solid leather or of wood covered with leather, the outside dimensions of which should not exceed 2 feet long by 1′ 3″ wide by 1 foot deep connected by straps and buckles so as to ride well on a pack *of any description*, and in which his kit would be carried; that he should be always provided with a cork mattrass, or hammock, and a waterproof sheet; he should also always be in possession of one 80 lb. tent complete, unless under regimental arrangements two officers can be told off to one tent of slightly larger dimensions; tentage being included in the India pay and allowances of each officer it was never contemplated that it was only to enable him to provide camp equipage in peace time only; each should have his own *separate* cooking canteen, and the best pattern I know of is the one in use in the German army and which was brought to my notice by Dr. Griffths Evans, Inspecting Veterinary Surgeon; or a small sized Warrens cooking pot. All the above would weight 160 lbs. which is a nice compact load for an ordinary baggage animal. Haversack, water bottle, note book which should also be adopted for reconnaissances, camp hatchet, camp phowrah, filter, clasp knives &c. &c., are of course necessary and in order to ensure uniformity it will be

Pattern room necessary.

necessary to have sealed patterns of *every* article of equipment deposited in one room at Army Heag Quarters of each army corps. No more should the disgraceful spectacle be witnessed of huge bathing tubs, large cases of provisions and boxes of boot varnish being carried to the front on Government transport, escorted by troops, and this when clothing, if not provisions, were required by the native troops and followers.

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Officers' baggage animals.

Every officer should be at all times in possession of a serviceable animal and equipment suitable for the carriage of every 200 lbs weight of baggage, camp equipage &c., that is allowed him on service, either kept with the regimental transport or what appears better, by himself, receiving from Government an allowance for this purpose of say ten or fifteen rupees a month at the most, which would be amply sufficient to cover everything.

As a matter of fact there is scarcely an officer who has not a pony of his own of some sort which he would only have to train and provide a pack of the regulation pattern for, retaining the animal for his own private use the whole time, the commanding officer being responsible that it is fit for transport work whenever it may be required.

This rule should be made applicable to *all* commissioned officers in every department: and would go a long way towards stopping the carriage of private baggage on public transport animals—which so scandalised Sir Charles Napier.

In the Russian army all mounted officers receive forage in kind or an allowance for chargers and baggage animals, which is increased in time of war.

Office records, &c.

As a scale has been fixed for the weight of records, stationery, &c., that may be taken by each departmental and regimental office on service beyond the frontier, it appears necessary that a regulation pattern pair of boxes should also be ordered, in which to pack and carry them; the pattern being sealed. I can recommend nothing better than the leather mule boxes that were used by Colonel C. M. MacGregor during the last campaign. No office should be considered complete unless it is in possession at all times of one or more pairs of such boxes, ready for immediate use.

Entrenching tools.

As the carriage of entrenching tools forms an important part of Regimental Transport it is necessary that each regiment should always have with it the full proportion of pack animals, and cradles or bags required for that purpose—in order that by constant exercise with them in peace time both men and animals may become familiar with their use.

In addition to the full complement of tools, each animal should always carry at least four spare handles, with which to replace breakages—also a strong hammer and a few nails in a small bag—and I may add here once and for all that every baggage animal with pack or harness should always have a koorpa or grasscutter's hoe attached to his equipment, and *no* stallions should be allowed.

The tools should be adopted to the habits and national customs of the men; the scale allowed for the 21st Punjab Native Infantry in Abyssinia was

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50 Pickaxes.
100 Mamooties.
2 Crow-bars.
12 Axes.
170 Jungle knives.

and is the most suitable that could be devised for a regiment of native infantry.

Major Griffiths, in his book on the English army, urges the desirability of keeping *all* entrenching tools in the hands of the Royal Engineers, as they should be entirely responsible for the construction of all shelter trenches, &c; fractions of the corps being specially attached to each infantry brigade for that purpose. I do not think his plan would do for European warfare and it is certainly quite unsuited to India or Asia, where regiments and even companies are so frequently detached and require their entrenching tools always with them.

Ammunition.

One very important point in a transport system is the provision of carriage for ammunition. To provide troops in action with ammunition is not such an easy matter as it seems. During the late Russo-Turkish war, the first reserve for the Turkish troops was carried with the men on pack animals and the second in carts some way in the rear; when one load was expended, the animal was sent back for more; but as the troops almost invariably acted on the defensive, it was comparatively easy for them to do this.

In order that our troops should have constant practice in this work each regiment should always have with it a sufficient number of pack animals for the carriage of the first reserve for one half battalion, with say, three spare; and part of the equipment of each of these animals should consist of a double sling bag made of stout leather, copper bound and rivetted so made as to hold one small-arm ammunition box on each side, each bag having rings or hooks corresponding to similar ones fixed on the pad or saddle so that by means of leather thongs the load can be secured from slipping back or forward.

The rest of the ammunition animals would be kept with the brigade or division transport.

The necessary establishments would be kept up exactly in accordance with what is now allowed on the Khyber-Kabul line of communications (vide appendix).

Baggage, tents, cooking pots, medical stores.

Sufficient transport should be kept with each battery and regiment to carry the service allowance for half a battalion of infantry, three troops of cavalry, or two guns; with rations, medical stores &c., for three days; for this purpose regiments located in the hills would require only pack animals, but those in the plains would be able to employ small regimental carts for every thing except perhaps the medical paniers. Such carts with

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their animals and harness forming part of the regular Regimental transport, *pack equipment being also kept for each draught animal.*

Small tents would have to be used, and the present clumsy cooking pots would have to be replaced by others of a more serviceable pattern.

All the rest of the Transport requisite for carriage on the service scale for full regiments or batteries would be kept at Brigade or Divisional Head Quarters.

Russian Kitchen Cart. For a description of this see appendix.

Great expense. Against all this is the extra expense that it will cause, but I maintain that any expense is compensated for by the increased mobility and efficiency of the army, as regiments proceeding on service would take all their transport with them by train to where the railway ends, and would then march straight away.

Reduction of regimental grass cutters, and moveable column carriage. As a very small set off, however, to all this expense I would urge the desirability of abolishing all grass cutters of British cavalry and artillery; they are not only quite useless for Transport purposes, but actually increase the difficulties, as on service food and clothing have to be supplied to them, and grain and fodder has to be carried for them. It may be urged that they would be useful on service to bring in fodder &c. but the regimental transport of all mounted corps, if supplied with large nets, or bags like those in use with the cavalry of the Corps of Guides would be far more useful. During peace time grass can always be purchased of better quality and at a lower cost than is incurred by keeping up a lot of men and animals to cut and carry it.

The grass cutters with *Native* cavalry regiments are part and parcel of the system and only require to be supplemented by a few ammunition animals to make the transport of such corps perfect.

The greater part of the present moveable column camels and elephants would be abolished, and the annual expense of hiring carriage for troops marching would be avoided altogether.

The transport of sick and wounded in Asiatic warfare having received the most careful attention of such able organisers and administrators as Surgeon General Innes and Brigade Surgeon Major Marston, has not been dwelt upon in this essay.

The Transport of Engineer equipment, Pontoon and Brigade Trains, Field Telegraph, and Siege equipment and stores, has been all provided for in the most efficient manner possible by the Royal Engineers in each Presidency, and after the completion of the field operations in Afghanistan will doubtless be still further improved, and one universal system adopted in all three Presidencies.

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List of works consulted.

The Russo-Turkish War by Lieutenant F. V. Greene, Engineer of the United States Army.

Longmore's Treatise on Ambulances.

Yovatt on the Horse.

Holland's account of the Abyssinian Expedition.

Studies on Military Transport by Major Furse.

Essays by Sir Charles Napier K. C. B.

Armed strength of France by Lieutenant Colonel C. East.

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APPENDIX I.

In France the transport of an Army in the Field is of two descriptions. That employed with the Army and which follows its movements; that employed in the rear of an Army and on the lines of operations, and each of these is again sub-divided. These means of transport have a distinct organization and are worked independently of each other; when however they march together as in a convoy they are placed under the orders of one commander. A law for regulating the supply by requisition of horses, wagons and carts in France, on any portion of the Army being mobilised, or during manœuvres, was passed by the French Senate on 16th March 1877. The Intendance makes contracts for the provision of all auxiliary means of transport, and is entrusted with the organization, direction and superintendence of all transport &c., provided for general purposes. The Commander of an Army Corps is the direct and responsible chief of the administration of his Army Corps.

Regimental carts for the transport of officers' baggage, pioneers' tools, archives, provisions of the 1st line and a reserve of clothing are at all times in charge of corps which are responsible for their maintenance, and preservation. When a corps changes its garrison it takes its carts with it. These carts and the necessary harness are provided from the Artillery manufacturing departments and are inspected once a year by an officers of that branch. Carts, one per Battalion, are allowed to be kept in daily use, the rest are placed in store-houses; the carts so allowed to be used are provided by the state and are in charge of the corps. When mobilization takes place the full complement of horses is obtained by requisition. The carts to which general officers and staff are entitled are generally in charge of regiments stationed in the same garrison.

A regiment of 3 active battalions of 4 companies each, 224 men per company has the following 2 wheeled carts each with one horse.

4	Carts officers' baggage, 1 per battalion, 1 for staff,	
3 „	Ammunition, 1 per battalion.	besides 1 pack animal per company for entrenching tools and 3 pack animals with medical panniers.
1 „	Pioneers' tools.	
1 „	Reserve of clothing and necessaries	
17 „	For two days' provisions.	
3 „	Canteen keepers.	
Total 29	one horse Regimental Carts	
3	„ „ Canteen carts, same pattern.	
15	Pack animals.	

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A Regiment of Cavalry has 3, two horse wagons for officers' baggage
13, „ „ „ 2 days' provisions
1 forge, „ (4 horses).
1, pack animal for Veterinary panniers
2, „ „ Medical „

The regimental carts are of 1874 pattern, covered with a water proof canvas hood, in front there is a small seat for driver, and in rear a place for forage, each carries a shovel, pick, screw wrench and grease box, net weight is 790lbs. extreme width 5′ 9″. The drivers or men in charge belong to the regiments and receive no extra pay; in war an infantry regiment tells off for this purpose 1 Corporal and 30 men being 1 man per cart or animal; in peace, 1 Corporal and 4 men. The whole of the Regimental Transport is in charge of the 'Vaguemestre."

Maximum weight to be carried in these one horse carts is 1100lbs.

Officers' baggage is packed in regulation boxes, interior dimensions of which are 2′ 1½″ long, 11½″ wide, 8½″ deep, weighing empty 10lbs. about, or filled 30.8lbs and are issued 4 to a Colonel, 3 to a Lieut.-Colonel, 2 to a Chef de Batallion or corresponding rank, 1 to all other officers= 81 for a regiment of infantry, issued gratis by Government in first instance and officers are only allowed to use them when changing garrison, at manœurres, or when mobilised.

Officers' *Canteens* are provided by Government in the same way as the baggage boxes. Each regiment of infantry has 2 for the staff and 5 per Battalion; the other branches of the service being in a like proportion. Each canteen contains sufficient cooking pots plates &c., for 4 officers; interior dimensions 2′.3¼″ long, 1′ wide, 1′.3¾″ deep, weighs empty 26lbs., full 44lb., and the price is about 12 shillings.

Reserve of clothing. The regimental cart carries.

150 Pairs shoes. 150 „ Canvas gaiters. 150 Shirts. 150 Flannel belts. 50 Pairs trousers.	Contained in 5 boxes; a 6th box contains materials for repairs of equipment and clothing.

Ammunition Cart carries.
9360 rounds or about 10 rounds per man.

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The Transport provided for the Staff of Army Corps for baggage and provisions is as follows:—

	Carriage for Baggage.		Carriage for Provisions.	
	1 horse.	2 horses.	1 horse.	2 horses.
Head Quarters of the Army Corps (including general, artillery and engineer staff)	5	8	7	0
Head Quarters of a division of infantry	2	3	3	0
Staff of an infantry brigade	1	0	0	0
„ „ cavalry „	0	1	0	0
Artillery park	0	2	0	19
Reserve and engineer park	1	0	3	0
Ambulance of Army Corps	2	0	5	0
„ „ Division of infantry	2	0	3	0
„ „ the cavalry brigade	1	0	3	0
Convoy of provisions of a division of infantry ...	0	1	0	110*
„ „ „ of Head Quarters of Army Corps	0	0	0	146†

* 24 four horsed wagons, in addition.
† and 30 „ „ „

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APPENDIX II.

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KABUL FIELD FORCE.

CHIEF DIRECTOR OF TRANSPORT AND IN CHARGE OF 1ST DIVISION.
STAFF OFFICER TO CHIEF DIRECTOR.
PAYMASTER.
INSPECTING VETERINARY-SURGEON.
VETERINARY-SURGEON.

1ST DIVISION.	2ND DIVISION.
Chief Director in charge.	Director of Transport.
General Transport Officer,	General Transport Officer.
Assistant General Transport Officer.	Assistant General Transport Officer.
1st Brigade Transport Officer.	1st Brigade Transport Officer.
2nd Brigade Transport Officer.	2nd Brigade Transport Officer.
Cavalry and Artillery Transport Officer.	3rd Brigade Transport Officer.
	Cavalry and Artillery Transport Officer.
TRANSPORT OFFICERS.	TRANSPORT OFFICERS.
1 per 1000 animals belonging to the General Transport of the Division and Brigades.	1 per 1000 animals belonging to the General Transport of the Division and Brigades.

SUMMARY.

1 Chief Director of Transport and in charge of 1st Division.
1 Staff Officer to ditto.
1 Director of Transport.
2 General Transport Officers.
2 Assistant General Transport Officers.
1 Pay Master.
5 Brigade Transport Officers.
2 Cavalry and Artillery Transport Officers.
Transport Officers at 1 per 1000 animals.
1 Inspecting Veterinary Surgeon.
1 Veterinary Surgeon.

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PAY &c.

STAFF PAY.

			Horses.	
Chief Director of Transport	Rs. 800 per mensem, *viz:* 500 Rs. for charge of Division and 300 Rs. extra as Chief Director.	In addition to Staff Corps pay of rank.	2	These are the numbers of horses allowed to be kept and for which forage may be drawn on payment, but horse allowance is not given.
Director of Transport ...	Rs. 500 per mensem		2	
Staff Officer to Chief Director	,, 250 ditto ...	In addition to Staff Corps or regimental pay of rank and ½ staff of any permanent appointment he may hold.	2	
Paymaster ...	,, 300 ditto ...		1	
Inspecting Veterinary-Surgeon.	Pay and allowances of rank, including horse allowance.	.....	...	Allowed to keep his authorized number of horses.
Veterinay-Surgeon ...	,, ,,	.....	...	Do.
General Transport Officer ...	Rs. 250 per mensem	In addition to Staff corps or regimental pay of rank and ½ staff of any permanent appointment he may hold.	2	
Asst. Genl. Transport Office	,, 200 ditto ...		2	
Brigade Transport Officer ...	,, 200 ditto ...		2	
Transport Officer ...	,, 200 ditto ...		1	

DUTIES &c.

Genl. Officer Comdg. in the Field.

1. The entire control of all transport arrangements in the field rests with the General Officer Commanding, whose staff officer in this Department will be the Chief Director of Transport.

Chief Director of Transport.

2. The Chief Director of Transport will have his post as a rule with the Head Quarters of the Force.

3. He will direct the Transport of the 1st Division as well as have supreme control, under the orders of the Lieutenant-General Commanding, of the entire transport of the Force.

4. He will receive his carriage and its equipment from the Director of Transport on the line of communication.

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5. All requisitions for transport and equipment &c., will be made by the general commanding on the General Officer controlling the line of communication, who will lose no time in forwarding them to the Advanced Depôt, Kabul, for transfer to the Chief Director.

6. The Chief Director will, however, have power under the authority of the General Officer Commanding to increase the transport locally, to meet urgent requirements, by purchase or by contracting for carriage of supplies in advance of Kabul.

7. He will receive reports from the Director of the 2nd Division of the number and description of all transport animals in his charge, and compile a weekly report on the entire transport and equipment of the Kabul Field Force, for transmission to the Quartermaster-General, through the Lieutenant-General Commanding, for the information of the Commander-in-Chief and Government.

8. With every batch of animals received from the Director on the line of communication, he will be furnished with a return giving the following particulars:—

i.—Roll of drivers and other transport servants, shewing their rates of pay, clothing sent with them, &c., &c.

ii.—List of equipment, &c.

iii.—Last pay certificate of drivers, owners, &c.

9. Nothing in the above shall be held to relieve the Director of his responsibility to the Controller-General of Supply and Transport, and to the Government in all matters of departmental management, such as strength, working and engagement of establishment; acquisition, except through the Commissariat Department, of all transport animals and transport equipment; contracts or agreements for conveyance of stores, &c., by Koochies or other carriers; submission of such information and returns as may be needed by the Controller-General Supply and Transport or by Government, &c. &c.

Staff Officer to Chief Director of Transport.

10 The Staff Officer will keep up the following books under the orders of the Chief Director

i.—Register of animals received from the Director or obtained locally, which shall show separately Government cattle and hired animals.

11. Regarding hired cattle, should there be any, the following particulars will be registered:—

(*a*).—Owner's name, description and district.

(*b*).—Terms on which hired.

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ii.—Roll of drivers and other transport establishments with the force.

iii.—Register of equipment showing receipts and issues.

iv.—Letter book.

v.—Convoy book showing how all the transport is employed.

vi.—Cash account book.

12. The Director should determine what office establishment is requisite, and should apply for such sanction for its entertainment as may be necessary, but should not delay the needful arrangements for providing it, but carry them out provisionally, pending sanction.

Paymaster.

13. The Paymaster will have his post wherever the Chief Director may determine.

14. He will have an office of accountants and clerks to be determined by the Chief Director, and subject to the confirmation of Government, and keep the entire accounts of the transport department, including pay of establishments, and of hospital kahars, and all other disbursements.

15. It is to be clearly understood that the duties of Paymaster are not exclusively, or even chiefly, those of audit, but he is to make payments and other disbursements, compile accounts, and send in the collected accounts of the department.

16. He is to see that followers and cattle are, on transfer, struck off one officer's roll and brought on to another roll, and he will exercise a general superintendence over disbursing officers' accounts, so that in his general account to the Examiner, which will be for the most part a compilation of the subordinate accounts, the Examiner will have no difficulty in tracing men, cattle, supplies and money from one set of rolls, and accounts to another.

Inspecting and Veterinary Surgeons.

17. The Inspecting Veterinary Surgeon and Veterinary Surgeon will be posted wherever the Chief Director may consider most expedient. One of these officers will however always remain at the base, whenever the other is detailed to accompany any forward movement.

Director of Transport with each Division.

18. The Director of Transport will be allowed an office establishment to be determined by the Chief Director, subject to the confirmation of Government, and will keep up the following books:—

i.—Morning state book.

ii.—Numerical receipt and issue book of all animals received from the Chief Director.

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iii.—Pay book.

iv.—Cash account book.

v.—Letter book.

19. He will submit monthly a muster roll of, and pay bill for, the whole establishment to the Chief Director.

20. He will maintain a reserve of animals—number to be determined by the Chief Director, from which to replace casualties.

21. He will establish a sick depôt for the Division into which all serious cases of illness amongst the transport animals, whether regimental, brigade or general, will be received.

22. He will report to the Chief Director all losses of animals and equipment, also all recoveries, giving such particulars as will enable the Chief Director to keep up his registers. He will at the same time submit a requisition to replace deficiencies.

23. He will submit to the Chief Director a weekly state of the transport and equipment of the Division.

24. If necessary he will receive from the Chief Director an advance of cash suitable to the circumstances to meet payments between musters.

25. He will arrange, in communication with the Commissariat Officer, for the conveyance of all supplies to the depôts determined on by the General Commanding.

General Transport Officer.

26. The General Transport Officer with each Division will have special charge of the reverse and sick depôts, and of the transport other than regimental and brigade.

27. He will have an office establishment to be determined by the Chief Director, subject to the confirmation of Government for the transport, equipment and supply branches, of which he will have special charge under the orders of the Director.

28. He will keep the following books:—

i.—Morning state book of the general transport, and that in sick depôt.

ii.—Register of animals received into the sick depôt, and discharged or otherwise disposed of.

iii.—Letter book.

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Equipment Branch.

i.—General account book shewing all receipts and expenditure—payments to workmen and advances to contractors.

ii.—Ledger—in this each contractor, or shop-keeper or others whose account is an open one, will be given a place, and have a Dr. and Cr. account.

iii.—A store book shewing receipts and issues of all stores, gear and equipments.

For the Supply Branch.

29. The accounts will be kept as in the Office of the Commissariat Department.

30. The General Transport Officer will open temporary workshops, when practicable, employing the labor of the country for renewals of worn out equipment, and repair generally—the extent to be regulated by the Director of transport according to requirements.

31. The supply of forage only for the Transport Department will be undertaken by that Department, and under mutual arrangements between the Commissariat and Transport Departments, with the approval of the General Officer.

32. Grain will be obtained by the Transport through the Commissariat Department, and should, whenever practicable, be drawn in bulk and not by rations.

Assistant General Transport Officer.

33. The Assistant General Transport Officer will assist generally in the transport work at Divisional Head Quarters.

Brigade Transport Officer.

34. A Brigade Transport Officer will, as a rule, be with the head quarters of his brigade. He will exercise a general supervision over all the transport of his brigade.

35. He will receive bi-weekly transport states from regiments and batteries, and furnish a compiled bi-weekly report, shewing casualties, &c., to the Director of Transport.

36. He will report immediately to the Director of Transport all losses, whether by death, desertions or theft, also all recoveries, and submit a requisition for animals to replace casualties.

37. He will obtain small cash advances, as required, for payment of broken periods.

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38 The transport other then regimental attached to the brigade will be under him.

39. He will have the following establishment :—

1 British non-commissioned officer or private who will act as clerk.

2 Native shoeing smiths at Rs. 15-each.

40. He will keep up the following books :—

I. Daily state book.

II. Cash account book.

III. Letter book.

41. Transport Officers will be in charge of sections of transport composed of 1,000 animals, and be responsible for their condition, feeding, care and equipment.

42. He will at once bring to the notice of the superior transport officer he may be serving under, any losses of animals or equipment, cases of sickness, gall &c.

43. The transport attached to a regiment of British cavalry or infantry will be placed by the commandant in the charge of an officer, who should not be the Quarter-master.

Regimental Transport.

44. No extra pay will attach to his appointment; but officers not already in receipt of horse allowance will be granted that allowance at the rate of Rs. 30 per mensem.

45. The regimental transport officer will have as his assistants 1 non-commissioned officer from the regiment and 2 men per company or troop, who will receive working pay at 8 and 6 annas a day respectively.

46. The assistants will go through a course of training in packing and loading, under the superintendence of the Brigade Transport Officer, and be kept in constant practice in packing and loading the various descriptions of loads used in their regiments.

47. When the regiment or brigade moves, these men should be included in the baggage guard, and being trained packers and loaders as well as trained soldiers, celerity of movement of baggage will be secured without loss of fighting strength.

48. The number of men actually struck off duty for regimental transport duty will be regulated by Commanding Officers when the regiment has less than its full complement of carriage.

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49. In batteries of artillery the transport will be entrusted to a non-commissioned officer, aided by one of the battery establishment, both on working pay of 8 annas and 2 annas a day respectively.

50. In Native batteries and companies of sappers and miners the supervision of the transport will be entrusted to a native non-commissioned officer on working pay of 2 annas a day.

51. In regiments of Native cavalry and infantry the supervision of transport will be entrusted to the quartermaster, aided by a native officer, also two privates per troop or company on working pay; subadar 8; jemadar 6; non-commissioned officer and private 2 annas a day.

52. These should be regulated as regards numbers employed, and their training, under the rule laid down for British troops.

53. The following books will be kept up by regimental and battery officer when necessary:—

1. Register of animals received through the Brigade Transport Officer, and their disposal.
2. Register of equipment, shewing receipts and issues.
3. Muster roll book of transport servants.

General scale of Subordinate Superintendance for brigade and general transport animals.

For every 1,000 *animals.*

2 British non-commissioned officers or 2 native officers on working pay at present rates.
5 Native non-commissioned officers or soldiers, *i.e.*, 1 per 200 animals on working pay at present rates.
10 Jemadars at Rs. 12.
40 Duffadars at Rs. 10.
1 Muleteer to 3 mules at Rs. 8.
1 Camel driver to 4 camels at Rs. 8.

In addition for camels:
2 Naib Chowdries at Rs. 40.
2 Moonshees ... at Rs. 20.

For mules and ponies:
10 Native Shoeing Smiths ... at Rs. 27.
10 Native Saddlers at Rs. 15 and materials supplied.

Scale of Artificers for regimental transport Infantry:

1 Native Shoeing Smith at Rs. 27 a month.
1 Native Saddler or Moochee at Rs. 15 a month and materials supplied.

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TRANSPORT DEPARTMENT—KHYBER LINE.

GENERAL OFFICER COMMANDING.
CHIEF DIRECTOR OF TRANSPORT.
STAFF OFFICER TO CHIEF DIRECTOR.
GENERAL TRANSPORT OFFICER—(PESHAWUR.)
ASSISTANT GENERAL TRANSPORT OFFICER—(PESHAWUR.)
PAYMASTER—(PESHAWUR.)
INSPECTING VETERINARY SURGEON.
VETERINARY SURGEON—(PESHAWUR.)

1st SECTION.	2ND SECTION.	3RD SECTION.
Peshâwur to Basawal.	Barikab to Fort Battye.	Sufed Sung to Kabul.
Section Transport Officer, Lundi Kotul.	Section Transport Officer, Jellalabad.	Section Transport Officer, Sufed Sung.
TRANSPORT OFFICERS.	TRANSPORT OFFICERS.	TRANSPORT OFFICERS.
1. Jumrood.	1. Barikab.	1. Gundamuk.
2. Ali Musjid.	2. Rozabad.	2. Pezwan.
3. Lundi Khana.	3. Fort Battye.	3. Jagduluk.
4. Dakka.	Movable column.	4. Seh Baba.
5. Basawal,	Brigade Transport Officer.	5. Lattabund.
6. Lundi Kotul.		6. Bootkhâk.
(for movable column.)		Moveable column.
		Brigade Transport Officer.

ADVANCED DEPÔT.

ASSISTANT GENERAL TRANSPORT OFFICER—(KABUL.)
ASSISTANT PAYMASTER—(KABUL.)

SUMMARY.

1	Chief Director of Transport ...	... Head Quarters.
1	Staff Officer to Chief Director ...	... Head Quarters.
1	General Transport Officer ...	... Peshâwur.
2	Assistant General Transport Officers ...	Advanced Depôt Kabul and Peshâwur.
1	Paymaster	... Peshâwar.
1	Assistant Paymaster	... Kabul.
3	Section Transport Officers ...	... Lundi Kotul, Jellalabad and Safed Sung.
2	Brigade Transport Officers ...	... Jellalabad and Gundamuk.
15	Transport Officers	... For stages.
1	Inspecting Veterinary Surgeon	... Head Quarters.
1	Veterinary Surgeon	... Peshâwur

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PAY, &c.

Staff Pay.

			Horses.	
Chief Director ...	Rs. 800 per mensem.	In addition to Staff Corps pay of rank.	2	
Staff Officer to Chief Director.	,, 300 ,,	In addition to Staff Corps or regimental pay of rank and ½ staff of any permanent appointment he may hold.	2	
General Transport Officer ...	Rs. 400 per mensem.	Ditto ditto.	2	
Assistant General Transport Officer	,, 300 ,,	Ditto ditto.	2	
Paymaster	,, 300 ,,	Ditto ditto.	1	
Assistant Paymaster ...	,, 200 ,,	Ditto ditto.	1	
Assistant General Transport Officer advanced depôt ...	,, 250 ,,	Ditto ditto.	1	
General Transport Officers of sections	,, 250 ,,	Ditto ditto.	2	
Brigade Transport Officer ...	,, 200 ,,	Ditto ditto.	2	
Transport Officers ...	,, 200 ,,	Ditto ditto.	1	
Inspecting Veterinary Surgeon	Pay and allowances of rank.	....	*	* Authorized number for which horse allowance is drawn.
Veterinary Surgeon ...	Ditto ditto.	....		

Note.—Officers are permitted to draw forage on payment for the number of horses they are allowed to keep up, but horse allowance is not given, except to the Veterinary Surgeons whose pay and allowances include horse allowance.

DUTIES, &c.

Chief Director.

1. He will as a rule reside at the head quarters of the general commanding on the line of communication.

2. He will, under the orders of the general commanding, have the entire control of the transport arrangements along the line of communication.

3. He will enter into contracts for conveyance of supplies by Koochies or other local carriers when necessary.

4. The lieutenant-general commanding the Kabul field force will make his requisition for transport and supplies on the general officer commanding the line of communication, and it will be the duty

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of the Director to make the necessary arrangement to meet the demand and to forward every thing to the advanced depôt at Kabul for delivery to the Chief Director of the Kabul field force.

5. Nothing in the above shall be held to relieve the Director of his responsibility to the Controller-General of Supply and Transport, and to the Government, in all matters of departmental management such as strength, working and engagement of establishment; acquisition, except through the Commissariat Department, of all transport animals and transport equipment; contracts or agreements for conveyance of stores &c., by Koochie or other carriers; submission of such information and returns as may be needed by the Controller-General of Supply and Transport, or by Government; &c. &c.

Staff Officer to Chief Director.

6. Will be with the Director always and have such office establishment, and keep up such records and books, as the Director may find necessary.

7. The Director should determine what office establishment is requisite, and should apply for such sanction for its entertainment as may be necessary, but should not delay the needful arrangements for providing it, but carry them out provisionally pending sanction.

The General Transport Officer.
The Assistant General Transport Officer.
The Paymaster.
Veterinary Surgeon.

8. These officers will reside at the base, Peshâwur, and carry on the duties as at present, under the control of the Director, whose assistants they are.

The Assistant General Transport Officer—Advanced Depôt.

9. This officer will reside at Kabul; he is the Director's agent, and all convoys for the Kabul Field Force should be consigned to him.

10. He will be allowed an office establishment to be determined by the Director, subject to the confirmation of Government, and will keep such books and furnish such returns as the Director may determine.

11. He will establish a sick depôt for all cases of serious sickness amongst the transport animals coming up with convoys or for transfer to the Kabul Field Force; the latter should not be made over to the Chief Director until pronounced fit for service.

12. He will establish work-shops for the repair of equipment whether belonging to the line of communication or sent up for transfer to the Kabul Field Force, and will be provided with such establishments by the Director as he may need; he will also keep a reserve stock of equipment, so as to replace any lost or injured on the road.

13. On no account is he to hand over to the Chief Director, Kabul Field Force, incomplete or repairable gear. &c.

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14. The general transport officer in charge of each section will be allowed an office establishment to be determined by the Director, subject to the approval of Government.

General Transport Officers of Sections.

15. He will have a transport officer under him at each stage, with an establishment to be determined by the Director, including a mochi for repair of gear—and at his head quarters he will have a farrier and an assistant salootrie.

16. He will be allowed a small reserve of animals to replace casualties amongst the general transport employed on convoy duty.

17. He is to move constantly over his section, and personally to superintend the payments of his section.

18. He, as well as the transport officers at stages, will keep such books, &c., as the Director may determine.

19. The transport officers attached to movable columns and brigades at Lundi Kotul, Jellalabad and Gundamuk, will keep their transport distinct from the general transport of the line, and it will be distributed to regiments, batteries and departments.

Brigade Transport Officer.

20. He will keep the following books:—

1. Daily state book.
2. Cash account book.
3. Letter book.

21. The Paymaster will have an office of accountants and clerks to be determined by the Chief Director, and subject to the confirmation of Government, and will keep the entire accounts of the transport department, including pay of establishments, and of hospital kahars, and other disbursements.

Paymaster.

22. It is to be clearly understood the duties of Paymaster are not exclusively, or even chiefly, those of audit, but he is to make payments and other disbursements, compile accounts, and send in the collected accounts of the department.

23. He is to see that followers and cattle are, on transfer, struck off one officer's roll and brought on to another roll, and he will exercise a general superintendence over disbursing officers' accounts, so that in his general account to the Examiner, which will be for the most part a compilation of the subordinate accounts, the Examiner will have no difficulty in tracing men, cattle, supplies and money, from one set of rolls and accounts to another.

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Transport Officers.

24. Transport officers will be posted at the several stages along the road, and be under the orders of the transport officer in charge of the section.

Subordinate Superintendence.

25. The scale of subordinate superintendence to be as follows :—

Per 1000 *animals.*

2 European non-commissioned officers (or 2 native officers) on working pay at present rates.

5 Native non-commissioned officers or soldiers, *i. e.*, 1 per 200, on working pay at present rates.

10 Jemadars	... ...	... @ Rs.	12.
40 Duffadars	... ...	... @ „	10.
1 Muleteer to 3 mules	... ...	... @ „	8.
1 Camel-driver to 4 camels	... ...	... @ „	8.
In addition for camels	2 Naib Chowdries ...	... @ „	40.
	2 Moonshis	... @ „	20.
For mules and ponies	10 Native shoeing-smiths	... @ „	27.
	10 Native saddlers ... and materials supplied.	... @ „	15.

26. The establishments will be distributed on the line of communication at the discretion of the Director.

Assistant Paymaster advanced Depôt.

27. Will reside at Kabul. His principal duty will, whether Government or hired, be to see that all accounts of transport, including pay, hire, rations, &c., are made up to the date on which transport is handed over to the Chief Director, Kabul Field Force.

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APPENDIX III.

The highland train in Abyssinia was divided into 4 divisions of 2000 animals each; 2 divisions from Bengal and 2 from Bombay. It was under the control of a Sub-Director who reported direct to, and received orders from the Assistant Quarter Master General at Army Head Quarters.

The establishment for each division was

1 captain	at Rs.	120	a month.
3 subalterns	„	80	„
4 European inspectors selected from British regiments	„	120	„
20 jemadars or troop sergeant majors ...	„	25	„
80 duffadars or sergeants	„	15	„
667 muleteers (being 1 to 3 mules) ...	„	12	„
2 first class farriers	„	33	„
10 second class, for Bombay divisions only	„	23	„
1 smith	„	30	„
10 assistant smiths	„	15	„
1 saddler	„	45	„
10 assistant saddlers	„	18	„
10 bheesties	„	12	„
1 salootree	„	40	„
1 writer	„	40	„

each sub-division consisted of 150 animals.

Strict discipline was maintained.

This train worked splendidly from Senafè to Magdala and back.

The lowland train which worked from the coast to Senafè and back was under the immediate control of Lieut. Colonel Holland, the controller of supply and transport—with Major Warden as second in command; one staff officer, one pay master and a quarter master.

It consisted of

3 Divisions of mules.
3 do. pack bullocks.
3 do. camels.
1 do. carts.

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APPENDIX IV.

Specification of a light cart for single mule or pony draught, designed by Messrs. Bradley and Co. of Allahabad and proposed by them for regimental transport purposes.

Height of wheels	... 3′...7″
Outside track of wheels	... 4′...6″
Width of tire	... „ 2½″
Width of bottom of cart inside ...	... 3′...2″
Length do. do. do. ...	... 5′ „
Height of side of cart	... „ 10″
Height of lower transom above axle	... „ 10″

The body of the cart is supported by solid wooden blocks on each side, each of which consists of two pieces, 4 and 3 inches thick respectively; and is steadied by two iron diagonal stays from each block to centre of under flooring.

The body of the cart is made of sâl and the battens of good seasoned mangoe, or sâl if preferred; the whole bound together with strong iron bands and screws. Shafts and wheels of iron or wood.

Total weight empty with wooden wheels ...	Mds. 4...11 seers.
Do. do. do. with strong "T" iron wheels	„ 6...11 „
Carrying capacity up to 20 maunds.	
Price with wooden wheels	Rs. 95.
Do. do. iron do.	„ 110.

The greater strength and non-liability to crack from heat or to be injured by insects which is gained by having iron wheels is well worth the extra cost of them.

I consider this cart to be an excellent one in its way. Springs, of course, are not required nor are they desirable, but for regular army transport purposes, *i. e.*, for rough work everywhere I would recommend

1*st.* A reduction of the wheel track to the same width as the common country bullock cart, which could be easily done without much reducing the carrying power of the cart.

2*nd.* A reduction of the space between the body of the cart and the axle which would increase the stability, without reducing the strength of the vehicle; and would admit of

3*rd.* An increase of 6 inches in the height of the sides, which would increase the carrying capacity.

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4th. Arrangement of the splinter bar so as to admit of a second animal being hooked in, when required, on account of the roughness or steepness of the road.

5th. The addition of light props fore and aft to admit of the cart standing by itself, and of a drag.

These alterations are slight and trifling but appear necessary to the production of a good serviceable cart.

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APPENDIX V.

Regimental Transport in the Russian regular army.

The regimental train for a 3 battalion regiment consists of 41 waggons, and for 4 battalion regiments of 44 waggons as follows:— 15 for ammunition, 16 for rations, 4 for sick, 1 for implements of various kinds, (each soldier now carries a Linneman spade himself), 1 for the pay master's papers, 1 for the treasure chest. 1 apothecary cart, 1 for hospital effects, and 1 for the pharmacy; for 4 battalion regiments, 1 additional waggon each for ammunition, for rations, and for the sick.

All the waggons are for 4 horses except the apothecary cart which has 1 horse.

A cavalry regiment has 2 ammunition and 5 ration waggons.

The number of horses maintained in peace is only enough to give 3 horses each to the ration waggons, which do all the usual works required about the regiments. The waggons, horses, harness, &c., are issued but once, and each year an allowance of money is made for their repair or replacements, equal to one twelfth the cost price for waggons, and one tenth for horses.

The private train consists of the officers' carriages and baggage waggons and the company soup waggons. In peace time officers may have as many equipages as they wish at their own expense; in war they are limited to two officers' waggons for one battalion of infantry or two squadrons of cavalry; the weight of baggage allowed being 80 lbs. for field officers and 40 lbs. for company officers.

Each company and squadron has a small 4 wheeled cart drawn by one horse, which carries an immense soup kettle, and all the kitchen apparatus. During the war some companies had the patent iron kitchen on wheels, somewhat like a portable forge, but it did not give much satisfaction.

On the back of each infantry soldier's knapsack is fastened a copper kettle, an eliptical cylinder in size about 6 × 4 inches, and 5 inches deep. This is the dish on which he depends in time of war for all purposes; in it he receives his soup from the company boilers, makes his tea, and brings water, &c. &c. This with a wooden spoon comprise his personal mess outfit. The troops were often separated for long periods from their knapsacks, but this kettle was guarded with great care at all times.

Country carts are pressed into service by the intendance department at rates of compensation, and under restrictions defined with great minuteness in the military laws.

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Regular "intendance" or general transport has no existence in time of peace, and in time of war is provided for according to circumstances under the direction of the "chief intendant" of the army. Ox carts or horse carts are usually hired for the service at so much a month, and are told off into divisions of 350 waggons each.

(Extracted from "The Russian army and its campaigns in Turkey in 1877-78," by F. V. Greene of the United States Army.)*

Since this paper was written I have had the opportunity of seeing in actual use in Afghanistan a small two-wheeled cart, drawn by one mule or pony, which more nearly comes up to my idea of a regimental transport cart than any other that I know of; it was designed and built by Major Heyland of the 1st Bombay Lancers and has been used by him for some years, and being cheap, strong, light, well balanced, and capable of carrying a large and heavy load, is well adapted for army transport in India or Central Asia. This cart is well known to most officers of the Bombay army and in my humble opinion the Government of India would do well to have one made up by Major Heyland and submitted for special trial: the only improvements in it that I can suggest are,

1*st*. That the flooring of the cart should be made of wooden planks instead of rope netting, and that it be lower than the shafts, by which means greater strength would be gained, and the centre of gravity be much lowered.

2*nd*. That a spare linch pin, washer, grease box, and small box for tools should accompany each, fixed underneath.

M. J. K.—H.

* It is believed that the baggage of most of the Russian Infantry officers engaged in the campaign of 1877-78, was carried on pack animals.

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III.

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

BY CAPTAIN W. A. YULE,

1-21st R. S. Fusiliers, Offg. D. A. A. General Ceded Districts, Bellary.

Motto:—"A most difficult question for all Generals. Happy is he who can reduce the amount of impedimenta to be carried."

SIR G. WOLSELEY, on "Land Transport."

INTRODUCTION.

The events of the Afghan campaigns of 1878-79 and 1879-80, have most incontestibly proved that some more complete and more reliable organization for transport in war, than that at present existing is absolutely necessary for the Indian armies employed in Asiatic warfare. The want of such an organization was not so apparent in former Indian wars, presumably, not because an efficient transport system did exist then, but because its shortcomings were not so widely published and commented on. Then, not so much interest was taken in the subject by military writers in Europe, and by the reading public of England and India as of late years. Also in the two late Afghan wars there was but little time for even the rough organization that the transport, first sent to Abyssinia, had acquired at Bombay; and during the campaigns there has been little opportunity for originating or completing any organization.

Review of the ancient transport systems in India.

Before considering what sort of transport will best suit the requirements of the Indian army, it appears advisable to state generally what has been the previous transport system since the English began to make wars in Hindustan. The conquerors of India appear to have had to depend almost entirely on a contract system of carriage. They adopted the system they found being carried on by their allies and enemies. Wars were almost continually being waged, and there had arisen a class of people whose occupation was to move with the army, and contract to furnish the Commissariat with supplies and carriage for them. Noticeable among Indian carriers were the Brinjarries. It is to be presumed that these professional war carriers, by continual experience from necessity acquired a rough and useful organization. Nevertheless we know that Sir Arthur Wellesley was often much inconvenienced by the difficulties they gave him connected with carriage; but these difficulties were often overcome by increased payment for what they supplied and carried. Whether there did exist among these Brinjarries the rough organization referred to above, or whether they

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had no organization beyond what would be required as ordinary peace carriers, the writer is strongly of opinion that they must, from long experience of campaigning, have been at least more manageable and reliable that the great majority of the conscript homesick Punjaubee villagers who accompanied the division under Sir Sam Browne into the dreaded Khaibar Pass in November 1878. In the forty years that had passed since 1838 very little had been done to improve the transport system of the armies under the Commander-in-Chief and the great body of transport attendants had from disuse lost practical experience of carrying baggage and supplies in war.

Transport Losses in the Afghan wars of 1838-39.

In 1838 the forces that under Sir John Keene advanced across the Punjaub and Sind toward Candahar took with them 30,000 camels—besides other transport animals. The enormous losses of 20,000 of these animals from partly preventible causes during the Afghan war which ensued, possibly caused the Government of India and the commanders of her armies to devote more attention to transport and its orgnization for war. The enormous requirements of Indian armies made, and still continue to make, this a most important subject, and so long as large tents have to be carried and great numbers of followers provided for, transport will continue to be a primary source of anxiety to the commander of an army in the East. How far these great requirements have been, and will probably hereafter be modified, will be considered later on in this paper.

Sir C. Napier in Sind 1843-44.

Sir Charles Napier's transport system in Sind in 1842-43, altho' it was the first attempt at a thoroughly and purely military system of organization, was admittedly most efficient. The animals (camels) were divided into divisions of 600, with 600 drilled and armed drivers to each division. No escorts were consequently required, no grazing guards and no fatigue parties for loading. The general's mind was at ease regarding the safety of his carriage in a country, at that time, probably more infested with robbers than Afghanistan is at the present day.

The Mutiny 1857-59.

During the suppression of the Mutiny, the Commissariat furnished what carriage could be procured from the less disaffected districts, or through the agency of the wealthy and influential native contractors who continued loyal The requirements for baggage and tents and in many cases for supplies (not absolute necessities) were reduced to a minimum. The results of this reduction were not apparently by any means deadly or hurtful to the troops. Much of the transport was however of the worst description. Sir Hugh Rose in 1860 reported that the drivers of the army transport under him conducted themselves shamefully, that they estranged the people of the country and gave a bad example to the sepoys. He pointed out the necessity for a strict control over such people in a country circumstanced as India is.

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China war 1860.

The China war of 1860 affords an example of Indian troops employed in Asia beyond seas along with a British force under English "Home" Commissariat arrangements. The drivers of the animals employed for transport were natives of India, China, and Manilla. Pack animals and wagons of the Woolwich pattern were employed. The soldiers of the then newly organized military train were employed for supervision, one to every 10 drivers and 30 animals. This arrangement was not a success. There was also a Chinese coolie corps, and a system of river transport, and a separate transport of 3000 Chinese carriers was employed. To superintend these, officers of the Line and Indian armies were employed and they were helped by interpreters who ranked and did the duties of non-commissioned officers. The experience of the war as regards river and carrier carriage is useful in considering the requirements for transport on the N. E. frontier or in Burma.

Sittana.

In this campaign the transport consisted chiefly of hired camels and pack mules; there was much delay arising from want of organization of the transport. Sir John Adye says regarding it, "the mere hasty collection of animals never can constitute an effective transport."

Abyssinian war 1867-68.

The recommendations of the then Commander-in-Chief in Bombay regarding transport for the Abyssinian war were not approved of by the Bombay Government and a civil scheme of transport was adopted. This scheme proved quite unreliable; there was great confusion among drivers, and neglect and mortality among animals on arrival in Abyssinia. The transport was there, chiefly by Sir Robert Napier, reorganized and received valuable aid from the arrival of the Lahore Mule Train which had been organized in the Punjaub in September 1867. The men were hired with their animals, and their military organization was perfected during their march to Kurrachee for embarkation.

When the expedition advanced on Magdala, the transport was divided into a Highland and a Lowland Train and worked with as much efficiency as the nature of the country permitted.

Considerable assistance was given by pack transport locally hired, and by purchasing animals from the people through whose country the army marched. Also the experiment of purchasing animals in Europe, chiefly along the Mediterranean was tried successfully. The hired drivers from the same localities were not a success, as they were not acquainted with any language used by the Line and Indian officers employed as superintendents in the transport and were said to be the scum of the Mediterranean and Black Sea littoral. The Persians were more suitable; but as regards drivers for animals it became clearly evident that natives of India, and particularly Punjabees, were by far the most reliable and

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suitable. The superintendents in this war were highly paid and were assisted by English non-commissioned officers. Wheeled carriage was but little employed ; but a railway was latterly utilized. The difficulty of supply of water and forage was very great and required the display of much scientific resource in order to overcome it, and keep men and animals alive.

The Commissariat Transport & Movable Column carriage.

Having thus rapidly reviewed the transport arrangements which have been made during the principal wars in which Indian armies have been engaged on the Asiatic Theatre for the forty years preceding the first phase of the present Afghan war, it would appear desirable, before entering into a consideration of the transport organization then instituted, to state briefly what the Government of India had done to organize a permanent carriage establishment, and under what management. The transport arrangements having from a remote period been under the Indian Commissariat, that department had, notwithstanding the great losses under their supervision in the advance on Candahar in 1838, continued to superintend the carriage of the Indian armies. Beyond the consideration that it has always supplied transport animals and conveyances, and that it has from the nature of its duties attained a well deserved great name and influence among the people who have command of such, there seems no well grounded reason why the Indian Commissariat, after once supplying carriage, should be delegated to look after it, and order its movements. The arguments for and against commissariat supervision are many and among military men who have made a study of the subject of army transport, are well known. They ought however perhaps to be here generally stated with this preliminary remark that the jealousy, which has been alleged to exist in the Home and Colonial commissariat control of the Transport ought not, from the very organization of the Indian commissariat, to be considered as a bar to its cordial co-operation with the Quarter Master General's Department.

Supervision by Commissariat.

In favour of the Commissariat retaining its time honoured authority, it is urged that it has always been so ; that its name is great amongst contractors ; that it has continual dealings in peace time with these people, and consequent influence over them and ability to obtain men and animals in great numbers when required for war ; that it is accustomed to deal with the civil authorities ; that the men in its employ are acquainted with the system of supply and provisioning ; that to work a transport no further office organization than that existing in peace time is required ; that the department, responsible for the supply of food which is continually being consumed and requiring to be replaced, often from a distant base, should have undisputed control of the transport so as to provide food, and prevent accumulations at the depôts in rear ; and lastly that a separate transport would more readily comply with the troops' than with the Commissariat requirements.

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Supervision by the Quarter Master General's Department.

Those who would have the transport handed over to the control of the Quarter Master General's Department (which means that the General Commanding the troops should direct its movements,) do not see the force of many of the above arguments, and contend that the General in command, being chiefly concerned in the success of the forces under him, will through the Quarter Master General presumably assist the Commissariat Officer, to the utmost extent compatible with efficiency of the troops, by furnishing that officer with carriage for food &c., just as he would the Ordnance Officer or Engineer Officer; that the General has a greater stake than the Commissariat Officer in maintaining all transport efficient, and has more influence and power to make his wants known, and complied with; that the Quarter Master General only need be made acquainted with the General's plan of operations and that thereby greater secrecy in movement would be secured than if the Commissariat Officer proceeded to collect and distribute to the troops the transport, they would require for a move; that the Commissariat Officer is usually not in such close confidential communication with the General as the Quarter Master General is, and cannot therefore know what troops or posts require transport and what do not; that the Commissariat Officer is relieved from great labour and anxiety as regards transport, and presumably can give more attention to supply and should he require transport he can get whatever is available on application to the General; that there are not sufficient commissariat officers to look after the transport properly and that commissariat subordinates if procurable are not usually the class of men to get the most out of the transport; that regimental officers, from regiments not likely to be engaged in operations, are procurable in sufficient numbers and are at least as suitable for transport work as commissariat officers, and have from the nature of their regimental duties generally clearer ideas on the management of men, commonly called discipline, than officers who have for some time been removed from regimental influences.

The Movable Column carriage.

The system of movable columns and carriage for them as at present constituted in India dates from 1861. Captain Collen in a recent lecture furnished detailed information regarding this carriage. It is sufficient here to state that the carriage available in all India was considered sufficient to move the camp equipage, baggage, 7 days' food for British troops and 2 days' supplies for native troops and horses of 20 squadrons, 28 battalions, and 72 guns. But as it is a purely local carriage and was never intended to move a concentrated corps d'armée, or to act to any distance beyond the frontier, it can only as it is at present constituted be regarded as a valuable nucleus for training officers and attendants. It has however not been made use of for this purpose during the recent campaigns. It is widely scattered from Peshawur to Rangoon, and the numbers of animals and conveyances at the various stations of the three presidencies are in proportion to the fraction of the troops therein held in readiness

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to take the field to suppress local disturbances. The system apparently had its origin in the relations existing between the Paramount Power and the rulers of adjacent states as well as with its own subjects, and its existence was and is, notwithstanding the general introduction of railways, well calculated to diminish the number of troops and military stations by giving mobility to a considerable portion of what troops there are.

Its origin.

Its peace duties and supervision.

This carriage occasionally parades near the military stations with the troops detailed for the movable column and are presumed to be available for service at a short notice. The Commissariat are in charge of the carriage which consists usually of pack animals. In some stations trollies or carts are largely used with bullocks or mules and do much useful local work. The movable column carriage is not usually used for ordinary marches from one station to another. Its present intention would be defeated by thus largely using it and it would not be available for an emergency at its station if required.

There is not generally in the smaller stations an efficient military organization of drivers; they are simply hired men under civil control. The camels are generally hired from the great contractors and receive a rate of pay dependent on whether they are employed at work, or sent out to graze. The mules are usually the property of Government and all are branded, not with one uniform mark however. The mule trains in the Punjab are usually most efficient and have a military organization in troops under the superintendence of experienced and trustworthy native jemadars and duffadars with salootrees, bheesties, and mochies attached.

Organization of men and animals.

Taken altogether the movable column carriage is, when kept in practice by frequent marchings out and loading parades with the troops of the column, fairly reliable for the performance of what it was intended for, *viz.* to take the field fairly rapidly, furnishing supply for a small combined local force of all arms for a short and not far distant campaign. But in a protracted war or in a war beyond the frontiers of Hindustan where unusual and unforeseen contingencies occur, the supervision of the commissariat officer, and of the native jemadars and non-commissioned officers is not sufficient. Moreover there is no provision for supervision of the native subordinates employed, and the only supervision attempted during recent wars has been that of transport officers, generally quite unacquainted with the organization of the transport.

Good points of M. C. carriage.

Defects in M. C. carriage system.

Having thus roughly reviewed the transport arrangements that have been adopted for expeditions wholly or in part undertaken by Indian troops, and also the present movable column system; the writer proposes to note the requirements that should be taken into consideration in the formation of an Indian transport for Asiatic warfare.

The chief requirements an Indian transport should fulfill.

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The army engaged in such warfare would require a transport available

1*st.* for operations on an extended scale within the frontiers of Hindustan.

2*nd.* for foreign campaigns in the countries on the land frontiers to the north-west, north and north-east.

3*rd.* for wars carried on beyond seas. In this case possibly in co-operation with troops from England or the colonies.

For each of these different objects particular descriptions of transport would be more suitable than others, the description being dependent on the nature of the country in which war is to be carried on. It must also be borne in mind that in the case of foreign wars so long as there are English troops in India, there ought always to be available in the same stations with those troops sufficient reliable organized transport to move at least a portion of them. Consequently transport not well adapted for foreign war would be by no means useless during such war.

Defects of the present transport.

It has been endeavoured to be shewn that the present system of movable column carriage or transport is one well adapted for the requirements of detached columns during operations in India, or on its frontiers, if not protracted or if no unusual difficulties or complications arise, such as disease among animals and desertion and neglect of duty on the part of the followers. Now these same difficulties are what may be expected in all wars, and must be provided against by organization and discipline. The great defects of the existing arrangement may be briefly stated to be

1*st.* There is no provision made for adequate and intelligent superintendence by trained English officers and non-commissioned officers, and for organization when collected in large numbers during war.

2*nd.* There is no system for using the skeleton peace establishment as a nucleus for rapid augmentation and organization on the outbreak of a war.

3*rd.* There is a superabundance of animals, trained only as pack animals; there is no permanent coolie transport organization, and the enlistment and organization of doolie bearers is very defective and cruel.

4*th.* There is no adequate establishment of veterinary surgeons or even salootries, and great difficulty in procuring the services of such from the corps to which they belong.

5*th.* The shoeing smiths, and artificers in iron, wood, and leather permanently employed, are very few, and no adequate inducement is held

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out to such artificers to accompany transport animals during active operations when their services are much needed.

6th. The matériel, such as carts, trollies, harness, saddles, and pads kept in Commissariat stores is only sufficient for peace requirements. The trollies often used in cantonments are not suited for carriage of baggage, &c., over rough roads. The pack saddles, obtainable by local contract, are frequently defective, sometimes quite useless for service.

7th. The men employed are often old, and worn out, and the animals altho' long since trained are often quite useless through vice and improper handling.

Reforms proposed.

These being the principal defects of the present system the writer proposes that certain arrangements be made, and reforms undertaken, with a view of to some extent overcoming them, and eventually making the transport department able to at least grapple with one of the greatest difficulties of Asiatic warfare.

If there is something of good in an imperfect system, it is surely an unnecessary thing to wipe out what good there is. By an intelligent direction, and with little increased cost the Indian movable column transports may become in time, under the more general name of Indian Transport, a useful and reliable department, able to furnish in time of peace regimental carriage for manœvres (as well as departmental transport) without being put to any undue strain, and also, which is more important, capable of expansion on the outbreak of war to such dimensions as the Government may deem requisite. To achieve these desirable ends great and perhaps radical changes in organization are without doubt necessary.

Independent supervision of proposed transport.

First among these changes, the superintendence of all transport should be removed from the Commissariat Department and placed under a recognized and responsible chief as a separate department. Whether that chief should be in the position of a Secretary to Government is for Government to decide ; but that he should be a capable officer, it would be only consistent to assume.

Directors.

Under him (the supreme Director, or Director in Chief) Army Corps or Presidency Directors should exercise a less extended supervision, working in conjunction with the Quarter Master General's Department of the Corps or Presidency.

Superintendents or staff superintendents and assistant superintendents.

The immediate superintendence of transport establishments at all military stations where it is considered advisable to maintain such would be vested in officers taken from British or Native regiments or the presidency army generally—but preference should be given to the officers of regiments in the station so as to avoid unnecessary expense.

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A small staff allowance with horse allowance would presumably be sufficient to secure the services of officers with a natural liking for outdoor work with animals, and stable management, and not altogether averse to a little office work. Let these officers be as a rule subalterns who have qualified for employment in the transport department by passing a simple colloquial test in the language chiefly used by the cattle attendents, and a practical written or verbal examination in transport history, organization, equipment, the feeding of animals and the system of keeping transport accounts. Such appointments might he limited to a tenure of two years, and restricted to such officers as had previously acquired some experience as regimental transport officers. If would also attract officers to seek employment in the transport, regimental and general, if it were understood that only such as had thus qualified during peace would be considered eligible for active employment with transport during war.

Jamadars of troops

Duffadars of sections

Let the present system of muccadums or overseers be abolished and every fraction of transport be organized in troops under the immediate supervision of a well paid native jemadar with four duffadars to assist him and supervise the 4 sections of the troop. A monthly wage of Rs. 30 would secure good men as jamadars, and probably Rs. 12 or 15 would ensure efficient duffadars.

Duties of staff superintendents or assistant superintendents.

The officer in charge of the divisional, or brigade, or station transport should afford the commanding officers of regiments and batteries all the assistance in his power in instructing the regimental transport officers, N. C. officers, and soldiers in loading and unloading pack animals, packing carts and wagons, and making good breakages of gear, keeping the order of a column of animals or carts during marches by night as well as by day, and also point out the duties required to be performed by a baggage guard. Troops should learn transport guard and other duties on the same system as they learn great gun drill. To facilitate this, a portion of the general transport stationed in the garrison should for a few months during the drill season be attached to regiments and batteries under regimental transport officers and N. C. officers, subject to the supervision of the station transport officer acting under the Quarter Master General's Department. Besides this station or staff transport officer, there should be with him assisting him and undergoing instruction a certain number of N. C. Officers of British and Native corps in the command, on whose proficiency and progress it would be his duty to report, and who would subsequently, on his report, be considered eligible for duties with transport, general or regimental, during war. It is presumed that a certain amount of carriage from the General Transport depôt, over which this superintendent would preside, would be in daily requisition for local Commissariat and other departmental duties, or for the transport of troops' baggage on the march ; for

N. C. officers as overseers.

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it would be impossible that every regiment should retain sufficient permanent transport to meet Indian marching requirements without mobilizing the transport. The station superintendent would detail, for the minor departmental duties above referred to, British or Native N. C. Officers as inspectors, and be responsible for the proper performance of the duties. In cases of difficulty he would report to the officer of the Quarter Master General's Department on the spot and act accordingly, if necessary informing his Army Corps Director of the circumstances through the Quarter Master General's Department.

Duties of N. C. Officers.

Connection with Quarter Master General's Department.

During peace the supervision of the army general transport would be vested in a body of departmental officers, in number and with pay per mensem somewhat as follows.

Pay of Transport Staff non-regimental.

One Director General for all India	Rs.	2,500	Consolidated.
One Assistant ditto. ditto.	„	1,000	
Head Quarter Office Establishment and Travelling	„	500	
Four Directors for presidencies (or corps d'armée)	„	4,000	
Four Office Establishments and travelling expenses	„	400	
Forty Superintendents or Staff Superintendents of divisions or districts. Pay Rs. 70/, horse allowance Rs. 30/, office 30/.	„	5,200	In addition to regimental pay.
Sixty Assistant Superintendents of station, or brigades, on horse allowance only, Rs. 30/ and office Rs. 20/.	„	3,000	
Two hundred non-commissioned (British and Native) Inspectors.	„	2,000	
Total Rupees		18,600	

In addition to this staff for the Superintendence of the whole Transport Department and for the working of the general transport of stations, the writer would propose that there be also regimental transport officers in British and Native corps assisted by N. C. officers of those corps, appointed under certain regulations, by Commanding Officers their status being somewhat similar to the Regimental Musketry Staff. In native regiments this transport staff might consist entirely of native officers and N. C. officers or qualified sepoys and be placed under the Quarter Master's supervision. The qualification required from candidates for employment with regimental transport might be a practical examination as before referred to, and in case of British officers and N. C. officers a simple colloquial test. In order to qualify for passing the practical examination, facilities should be given to candidates to attend the General Transport Depôt for instruction and duty there under the Staff Superintendent.

Regimental Transport Officers and N. C. Officers.

Qualification.

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Subalterns of British Regiments would willingly seek the appointment of regimental transport officer even if no pay were attached to it. The chance of being selected for transport work in war would be sufficient inducement, but it would be advisable to give these officers say horse allowance 30/ and office allowance 20/ so that they should not be losers. British N. C. officers or privates should receive some small extra pay to ensure fairly good men seeking employment. Native officers and N. C. officers should also receive a proportionate allowance, and the Quarter Master at least office allowance. This pay to regimental transport officers might be only granted during the time transport animals were with the regiment or battery for manœvres, or drill, or during marches; and if available, a transport riding pony or mule might be placed at the disposal of each officer and N. C. officer. The cost of regimental transport superintendence per mensem would be for about four months every year about as follows in addition to regimental pay, throughout India.

Pay.

For British Cavalry, Infantry, and Artillery equal to say 100 Battalions.

100 Regimental Transport Officers	@	Rs.	50	Rs. 5,000
200 N. C. Officers	@	„	10	„ 2,000
For Native Cavalry and Infantry equal to say 200 Battalions.				
200 British Quartermasters	@	Rs.	20	Rs. 4,000
200 Native Regimental Transport Officer	@	„	15	„ 3,000
400 Native N. C. Officers or men	@	„	5	„ 2,000
		Total Rs.		16,000
				4
Total cost of regimental supervision for $\frac{4}{12}$ths of a year for all India.				Rs. 64,000

It should be the duty of this staff under the orders of the officers commanding regiments, &c., to supervise all transport with regiments and batteries, in all its details of loading, marching, halting, unloading, encamping, watering and feeding, to make frequent inspections of all animals and carts, to send all unfit animals to the general transport depôt for exchange, to care for animals temporarily unfit for work, and to carry out all orders regarding transport, pay all transport followers, and keep their accounts.

Duties of Regimental Transport Officers and N. C. Officers.

With regard to what has been previously noted as the second great defect of the existing system, the Commissariat Department does not seem to have even contemplated so organizing its carriage system that it might be rapidly augmented in time of war. Certainly the movable

Necessity for Mobilization of Transport for war, and trained supervision.

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column transport has not been used as a nucleus during the recent great demands for transport animals. The great bulk of the camels and mules that were employed with the divisions of the Peshawur Valley Field Force in and beyond the Khyber, were temporarily hired animals got together as rapidly as possible, and worked under the time honoured patriarchal system. supervised by Officers, who, as a rule almost without exception, were at first quite ignorant of the A. B. C. of transport duties, and quite unable to understand the principles on which the camels were divided into lots sometimes of two or three animals, sometimes of over one hundred. The Commissariat officers were generally too busy at Supply duties to be able to give much instruction to the Transport Officers, and were also possibly themselves frequently unacquainted with the details of organization of the hired animals. The result of all this was that a good deal of confusion sometimes was inevitable; the labour of Transport Officers was incessant and vexatious beyond conception, and until near the termination of the winter campaign of 1878-79 there was not much efficiency. The pack transport of the division, assembled at Gundamuk in May 1879, was in many respects thoroughly reliable and would have taken that division on to Cabul, but it had been collected at great expense, and the officers who had charge of it had profited by six months' experience.

Proposed system of Mobilization.

The writer proposes that the transport to be employed in any future war, whether Indian or foreign, should as heretofore be made up of the permanent carriage and hired animals and carts, but with these important differences viz: First:—that the numbers of Government drivers and animals should be largely increased at the outbreak of a war by recalling old drivers, recruiting new men as drivers, and purchasing animals both in India in the vicinity of the transport stations, and beyond India if necessary. Second as regards hired carriage:—that information be furnished by civil authorities of the quantity likely to be forth-coming voluntarily, or if not voluntarily then by compulsion, and that this carriage, on being collected and passed fit, be organized by Transport Superintendents, and their Assistants into troops of about 100 animals, and regularly taken charge of instead of as at present remaining in the payment and supervision of native Naib Chowdries, Missaldars, and Moonshees. Of course such people might with advantage be appointed jemadars of troops of hired cattle, and permitted to nominate eligible owners and drivers for employment as duffadars.

Troop unit of organization.

The most convenient unit of organization for all carriage would presumably be that by troops of from 100 to 150 animals with about 50 or 60 drivers.

In the case of Government or permanent carriage each troop should be subdivided into four sections, like the Army Service Corps. By adopting this subdivision, each Section ought to be able on receiving the order for mobilization to furnish the native Jemadar and two or

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three Duffadars required for a war troop as well as ten or twelve trained drivers with their animals. This jemadar and these duffadars would be furnished by promoting eligible duffadars and drivers up to the required number.

Purchase of animals and hire of drivers.

The animals required to complete each section up to troop strength would have to be procured by purchase (generally locally,) and drivers, by hiring eligible men from the vicinity. Carts, and equipment such as harness, pack saddles, clothing for man and beast, etc. should be kept in stores or previous arrangements made by contract for their rapid supply locally. There would thus only remain the disciplining of the new drivers, training of animals, and fitting saddlery and clothing.

Power of rapid augmentation.

By such a system the transport power of the Government permanent carriage would be increased if considered necessary four fold, and three times as much carriage as it may be deemed advisable to keep up permanently would in a fortnight or three weeks be ready to move (by rail or sea as required) to the theatre of operations.

Training of animals and discipline of drivers.

If properly handled by trained transport officers under a well considered system of supervision and discipline for even a short fortnight, a wonderful improvement would be found to occur. The drivers procurable usually are almost, throughout India, the best in the world. With a little discrimination in their selection for enlistment during peace, and on mobilization for war, they will be found full of respect for the authority of the British officer sent to command them.

Transport still remaining after Mobilization for local wants.

Three quarters of the mobilized transport having departed for the seat of war, there would still remain just as much transport as formerly available for local requirements, and for the transport of the movable column baggage in case of local disturbances. Moreover if the Government desired fresh reserves of carriage this portion of the permanent transport left behind at its station would be available for training and equipping a fresh lot of newly purchased animals, and disciplining and instructing recruit drivers. The quality of men and animals could not probably be maintained up to the peace transport standard but it might hope to approach it.

Organization of Hired Carriage on Mobilization.

In addition to the duties connected with the augmentation (by purchase) of the permanent carriage, the Directors and Staff Superintendents would have other equally important duties on mobilization connected with hired carriage. They would have to introduce a similar organization among this portion of the war transport, collecting animals and drivers by troops, appointing jemadars and duffadars, branding animals, inspecting gear and carts, preparing nominal rolls of all contractors, tokdars, owners, and drivers with every detail necessary to identify these men and their animals and carts, giving each individual man a document with full information about

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himself etc. thereon, a sort of soldiers small book in fact. Natives take care not to lose documents of this sort when convinced of the advantages they obtain by carefully treasuring them. Let it be clearly understood that this is never to be taken from the bearer and that all entries in it are to be made in his presence by a British officer and explained to him if necessary.

Payment of Drivers and Owners of Hired Animals and Carts.

Another important point in any system of organization is the way in which men are to be paid. Transport owners and drivers will look to the officers with greater confidence and respect their authority if these officers personally produce the rupees and pay them. Of course there would presumably be no objection to the agents of the contractors keeping what accounts they pleased. The presence of such agents would be desirable on pay days for purposes of identification, as well as at musters of hired carriage. This mustering is a most difficult undertaking requiring careful preconcerted arrangements in order to prevent the same animals being mustered twice or not mustered at all. The system latterly pursued in the 1st Division P. F. F. was to muster as if at midnight. This was effectual in a country where ordinary marches at night were of necessity never made.

Mustering.

Accounts.

In the regulation of hired transport it seems desirable that every man present should himself receive the pay of his rank as jemadar, duffadar, driver or artificer and his acquittance thereto obtained by the officer as well as entered in his small book. Afterwards those men who appear by an inspection of their small books to be owners as well as drivers, and whose animals and carts are effective in the superintendents daily state should receive the hire of their animals, this receipt being of course also entered in their small books and officer's acquittance roll and signed to by them. From these simple pay documents, surely accounts could be readily prepared subsequently at an office within the base of operations and a final settlement with each driver and owner come to.

Numbers to be in Charge of a Transport Officer.

It will be found most difficult on service to keep 500 or 1000 animals together. Convoys are usually restricted to 500 pack animals. Two or three hundred is a more manageable number. There appears no object to be gained in ordering that each Superintendent shall have charge of 500 or 1000 animals. Practically it will be found that all the animals and carts with a Brigade, or with one or more Departments can with advantage be placed under one Superintendent or Assistant Superintendent, each regiment having its own Transport Officer and all the transport of the Brigade being organized on the simple "troops" unit. Whether it would be desirable for the Regimental Transport Officer to accompany his transport, when withdrawn from the regiment for other duties, which must happen sometimes, or whether it is to be transferred to the care of a

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staff transport officer and its connection with the regiment severed is a question difficult to decide. The latter procedure is more elastic and straight forward, for the Director of Transport cannot bind himself to return the same carriage however desirable it may be to do so.

Orders for Mobilization of Transport.

All the orders for mobilizing the transport should be clearly drawn up and made a component part of the Regulations for the Army in India. The Civil Authorities concerned in mobilization should have their duties specified, and the part to be taken by the Commissariat in assisting to procure animals &c., by purchase and hire, very distinctly laid down for the guidance of all concerned.

Description of Transport to be employed.

With regard to what has been above noted as the third defect of the present system, viz: the unnecessary superabundance of pack transport, it is one that may be easily overcome. An annual expenditure for carts and wagons of an approved pattern and for serviceable harness is all that is required. Every mule, pony and bullock should be trained to both pack and draught, and wheeled vehicles be kept in store or be otherwise procurable for at least two thirds of the Government mobilized carriage animals. On augmentation, preference should, if possible, in purchasing be given to animals trained to draught as well as pack, but the fact of an animal not being trained to draught need cause little inconvenience, for Indian animals are quickly broken in.

Carriage of Sick and Wounded.

With regard to Doolie Bearers, organization is most urgently needed. Even if the Government of India should decide to do nothing to improve its carriage arrangements, it is absolutely necessary that some system more satisfactory than that at present existing should be introduced for the benefit of the sick and wounded of an army and their friends the doolie bearers. The simplest way out of the difficulty would be to abolish the doolie bearer and substitute ambulance carriage, but even then a bearer or *krankenträger* corps would be necessary for carriage of wounded on the field of battle. It would be probably desirable that the feasibility of wheeled conveyances being largely used in Asiatic warfare be clearly demonstrated before the wounded are committed to ambulances.

Difficulty of procuring Doolie Bearers.

There is little doubt that conscription in its most most unpleasant form, because very sudden and unexpected, has fallen heavily on many of the kahars of the Punjaub during the last two years. It is simply through want of organization that the Government was compelled to capture and forcibly send its own subjects to carry doolies and dandies in a campaign, where they suffered great and sometimes unnecessary privations, and whence they often returned (poorer men then they set out) to a starvation striken home. All this because their organization was terribly defective. Surely it is possible still to hire doolie bearers in parts of India where the doolie or dandie is still a recognized means of conveyance. Such

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men are the only ones that ought to be engaged as doolie bearers. Untrained men are worse them useless. Many lately employed were simply coolies, and quite unable to take their share in carrying a loaded doolie. The question of sick carriage may be considered foreign to a treatise on transport, but in itself it deserves passing comment, and is intimately connected with coolie carriage. such as would of necessity be adopted on our N. E. frontier to a great extent. Permanent coolie transport companies should be maintained there instead of the transport troops of animals elsewhere. The details of organization of such a corps would presumably with advantage be modelled after that got together for the last Looshai Expedition; particulars regarding which have been given by Sir Fred. Roberts in the U. S. Journal of India. The coolie corps might be made capable of expansion on mobilization and furnish doolie bearers for Asiatic warfare generally.

Coolie Carriage.

To place any transport system in a position to render efficient and continuous service, after being at the first start fairly organized and placed under efficient control, there are necessary many others besides the directors, superintendents, inspectors, jemadars, duffadars, drivers and the purchased or hired cattle in their charge. Such necessary persons are veterinary surgeons, either solely for the Transport or available to give veterinary aid to transport followers in the care of their sick animals. These Veterinary Surgeons might be natives; but in any case there would have to be depôts for sick animals with veterinary stores and instruments, and simple medicines; and it would be desirable that such sick animal depôts should be under charge of a qualified veterinary surgeon, with native salootries to assist him. There also must be provision for shoeing smiths, saddlers, wheelwrights, blacksmiths, and artificers as required with necessary tools and appliances. Puckalies and bheesties are also required. All such should be on the establishment in limited numbers during peace, and when the transport is mobilized their numbers should at once be proportionately increased at the station whence they would come along with the troops of transport animals, bringing tools and all necessary appliances with them. Not very many artificers are required (say 5 to 7 per cent of the number of animals) and as their duties are important it would be unwise to risk inefficiency by giving small pay. Such as have had previous employment with transport should be engaged in preference to others. To ensure that the Transport Directors and Officers generally shall be able to exercise an intelligent supervision of the work performed by the artificers, it would be desirable to make horse shoeing, fitting saddlery and harness, and the knowledge as to whether work in wood and iron and leather is good or bad, not the least important portion of the transport officer's qualifying examination.

Necessity for an establishment of Veterinary Surgeons, and Sick Animal Depôts in war.

Shoeing smiths saddlers, wheelwrights, blacksmiths and other artificers.

To secure a reserve of trained men with animals newly purchased on mobilization, a system lately suggested for trial in the Native Army by an Officer instead

Reserve of Trained Drivers.

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of the present pension system might be found suitable; that it is to say to enlist drivers for only 4 or 5 years on fair pay say Rs. 6 or 8 a month, then permit them to go to their homes on Rs. 2 a month, liable for training or service when called upon up to 21 years and then to be discharged if their services were not required with a bonus of say Rs. 40 and 50. A large admixtureof trained drivers will well repay Government their retaining fee by the increased care they take of the animals in their charge.

Clothing.

Having secured uniformity of organization it would be highly conducive to efficiency to adopt a uniform and serviceable dress. In the selection of such it must be sought to increase the comfort of the men without so far encumbering them with clothes as to make the carriage of their own goods and chattels a burden to the transport. Some very suitable garments were issued and eagerly sought by followers during the last Afghan campaign, but there was no attempt at uniformity. In addition to a light-grey coat and trousers it may be found desirable to issue putties and shoes as well as a blanket and waterproof sheet, but the issue of thick cloth great coats is a thing to be avoided if possible. In the issue of clothing for active service to followers of hired cattle it would be desirable to give them clothes of a colour or cut differing from that issued to Government permanent drivers. Thus the varieties of transport would be quickly discoverable and the permanent carriage subordinates temporarily attached to hired cattle would be easily distinguishable. The officers and N. C. officers ought to wear some easily recognized badge.

Arms.

All permanent transport followers should be armed either with a pistol or native sword and be trained sufficiently in the use of these weapons to prevent the chance of accidents. The followers with hired cattle during war ought at least to have a native sword. Certain picked men from among both classes of transport and all the native subordinates might be entrusted with carbines and 20 or 30 rounds of ammunition. All European and Native officers and British N. C. officers should carry revolvers and carbines (if they wish to have them) or their swords.

Adaptability of Transport Animals and Carts.

With regard to the description of animal most suited for Asiatic transport the Mule is certainly the best, notwithstanding the great drawback that he must be given food in addition to what he can pick up by grazing. However, recent experience has taught us that the camel must also be similarly fed when in strong work. Certainly in peace time the Camel does not require so much feed as the mule, and can carry a much greater load when employed as a pack animal: but then the camel's constitution breaks down utterly where the mule remains in perfect health, and the camel is not so suitable for draught carriage as the mule. We may hope with some confidence that wheeled carriage will be largely used in future Asiatic warfare. Certainly, in mountain countries if the road is passable for guns, wheeled carriage is

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more suitable than camels. But to be effective the mules or bullocks that draw the carts or wagons must be staunch up and down hill. They must be strauncher than many of the artillery teams considered fit for service in Bengal. There are few cantonments near which there is not some hill, up and down which the Transport Superintendent of the station can have the opportunity of training his refractory animals. Ponies are not so hardy nor so well adapted to pack carriage as mules, but being procurable in great numbers arrangements must be made for utilizing them. Mule saddles and harness of small size will fit ponies. The great difference in the back is the high withers of the pony Consequently a pony's back is ill adapted for a pad unless specially constructed and stuffed. The Otago saddle, small size, ought to suit ponies well. The proportion of sore backs amongst ponies is usually much greater than amongst mules. In fact among the latter, with care, sore backs ought to be unknown. There were about one thousand hired mules at Gundamuk with General Browne's division, and among them only ten or a dozen sore backs. After camels, mules, and ponies in order of transport value come Bullocks both for draught and pack. Were they not so slow their value would be greater but they too must be trained before being sent for employment in war. Draught bullocks with pack-saddles on them were sent to Jellalabad towards the close of recent operations and issued to a regiment as a portion of its carriage on the return march. Over one half of these animals refused to be loaded and actually travelled homeward to India without loads. A transport, conducted on such a want of system, is worse than useless. Last among transport animals comes the Donkey, possibly not the least useful if intelligently handled; but we have not much experience regarding his use.

Local and Climatic Considerations Etc.

It would seem proper that the animals best suited to the locality should be maintained at the military stations but that it should be a universal practice to train all suitable animals to draught as well as pack, and to keep up a proportion of wheeled carriage at every station whence roads lead, as well as gear and saddlery for a certain number of pack animals. Such proportions could of course only be determined by intelligent local observation. Where Elephants or Coolie Transport only could be used, there ought Transport Depôts for such carriage to be maintained.

Wheeled Carriages.

There is so much diversity of opinion regarding the relative superiority of various forms of two wheeled and four wheeled conveyances for war transport, that it will be no doubt difficult to decide on a general service Cart or Wagon for use in Asiatic warfare. Probably the better method will be to permit a certain diversity of pattern and to use both wagons and carts. As regards the employment of hired carts little choice is given to us. The cumbrous pattern of the country must be taken into our service, and we must do the best we can with it. It has some great advantages and some very great defects. But as regards a good pattern for a general service wagon for four mules or bullocks, that used in the United States of

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America would presumably be found best adapted for India. The *sine quâ non* of a good waggon for transport purposes in India are that the wheels be large so as to go over rough ground and that the workmanship be really good. If wood and iron are not well put together the vehicle will simply tumble to pieces in the hot weather. In order to ensure efficiency in this last respect, transport waggons should be kept in the open in all weathers. If they won't stand this test fairly well, they had better be left in the hands of the people who make them Provided the harness does not inconvenience the animals by being too scanty, the simpler it is, the better suited will it be for transport work. Sets of harness, of various sizes should be supplied. The leather of the country is so good that getting harness from England would be a wilful job. Of course all iron work, bits, buckles, etc. should be lacquered and the leather remain of its natural colour, grease composition only being used in keeping it in working order.

Harness.

The choice of pack saddles and pads is very difficult and will presumably long remain so. With skilled and careful drivers, taking their own time, almost any pack saddle or pad, that has ever been proposed, will shew good results. But what is required for military transport is a saddle or pad that even if put on carelessly or hurriedly and by unskilled hands, and an uncomfortable swaying load thereon heaped by still less skilfull hands (all this done probably in the dark) will not cause a very bad sore at the termination of a hot days march. Pads require care in putting on, and care in loading, and are consequently ill suited for military pack transport, except in the hands of very skilfull drivers. We are consequently reduced to the heavier, and more expensive pack saddle with its metal tree. All in all the Otago is the best although probably it could be much improved and somewhat lightened. Having selected as perfect a pack saddle as we are able to find, its good may be entirely nullified by the imperfect arrangement of the straps, of necessity attached thereto. The girths should be broad and strong and capable of being fitted to animals of very various sizes of girth. The breast strap, (the intention of which is to prevent the saddle going over the animals tail in ascending hills,) should be so supported by a strap over the neck as to prevent it falling down and impeding the movement of the laden animal's fore legs. Similarly the breeching straps ought never to cause the like inconvenience to the movement of the hind legs, nor ought they to cut the flesh of the quarters. And above all whatever gear is used should be suitable and properly fitted to the animal and marked with his class, troop, and number, same as on his hoof or shoulder; thus

Choice of Pack Saddles and Pads.

Marking and Branding.

$$\frac{\text{GTM}}{\overline{\text{VIIT}}}\ \frac{}{98.}\quad \textit{i.e.}\quad \begin{cases}\text{Government transport mule.}\\ \text{Seventh troop.}\\ \text{Number ninety eight.}\end{cases}$$

or

$$\frac{\text{GHP}}{\overline{\text{XXXV}}\,\text{T}}\ \frac{}{120.}\quad \textit{i.e.}\quad \begin{cases}\text{Government hired pony.}\\ \text{Thirty fifth troop.}\\ \text{Number one hundred and twenty.}\end{cases}$$

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Harness and saddles should be of good leather and strongly sewn. The above seem trifling considerations, but they cannot be neglected without jeopardizing the efficiency of any transport, without taking into account the misery animals endure through ill fitting harness.

Packages of Pack Transport.

In the event of its being necessary to make use of pack transport for the carriage of ordinary supplies, in addition to that of ammunition boxes, it is absolutely necessary that such supplies should be made up by the commissariat department into strong packages suitable for conveyance on the animals forthcoming. Large boxes however light are an abomination to the pack mule or bullock. Metal telegraph poles and trussed girders for bridging and bags of biscuit are looked upon in much the same light by the camel and his driver. When such articles must be carried along a road suitable for only pack carriage, elephants are the most proper animals to employ if their tender backs will stand them. Loading pack animals, particularly ponies and mules, is an art. Many of our Afghan enemies appear to understand it thoroughly, so do the syces of Indian cavalry regiments. It is an art that the soldier and sepoy should acquire as speedily as possible in his course of military instruction, and is generally of more value to him than the knowledge of intricate parade movements. The want of knowledge of loading displayed, and consequent cruelty probably unwittingly practised by many of our troops during the recent campaigns has been lamentable.

Loading.

Condensed Food and Forage.

Another point little noticed as yet with regard to transport, but destined to exercise a vast influence over the conduct of campaigns in unproductive or desert countries, is the increased use and adaptabitily of condensed and compressed food, vegetables, and forage. Herein lies antidote to our present great and almost overwhelming Transport difficulties. These difficulties often arise from the necessity for carrying large reserves of gun and small arm ammunition. These must be carried in order that the army may be able to fight and there is little chance of their being diminished in weight in future campaigns.

Their great value.

Consequently the portability of consolidated provisions, and particularly forage biscuits and kindred food for animals comes as a ray of hope to the perplexed transport officer. The value of these food and forage preparations has not probably been even conjectured by the most sanguine thinkers on military transport and supply. Other articles of consumption appear capable of being transported in a more condensed form then has sometimes been the case. It was stated that much of the rum carried into the Khyber Pass was carefully watered to the regulation weakness at the dirty Jumrood stream. If this was done it would increase the carriage requirements for rum about one sixth. Lime juice is another article probably capable of condensation. The

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great advantages to be gained will however arise from condensation of vegetables and grain for animals and men. Cattle for meat supply convey themselves, but the grain, they require to keep them in condition, must be carried. If condensed food agreed with them, benefit would result.

Employment of the Government carriage and hired carriage in war.

It would appear desirable that in a campaign the Permanent or Purchased Government Carriage should be generally employed with regiments under the regimental transport officers, and with what is usually classed as departmental carriage that is to say Medical or Hospital, Ordnance, and Engineer Park and Establishment. If possible it should also provide transport for the Commissariat requirements of the advanced troops. Hired Transport would presumably be found more useful when employed as "general transport" but must be considered as, equally with the Government purchased carriage, available, if required, for regimental or departmental work, and equally at the disposal and the absolute control of the general commanding, subject to no interference from the commissariat.

Transport Staff Appointments in war.

Appointments on the superior transport staff during war, would be made from among the Army Corps Directors, their Staff Officers and the Station Superintendents. Other trained transport officers, possibly from all India, would be placed in charge of transport of brigades or of departments, or of stations, depôts of sick animals, depôts of extra baggage, transport stores, and equipments, etc. It would be desirable that such superintendents or assistant superintendents of transport, non regimental, should be senior in rank if possible to the officers with regiments and batteries.

Civil authorities to furnish Statistical Information

To ensure some statistical information being available in time of peace regarding the capacity to supply drivers and animals of the country in the vicinity of the chief military stations, the civil authorities should be directed to furnish the Government with certain returns for the guidance of the Director General of Transport and his Army Corps Directors. In all such returns the price at which animals could be purchased would be stated roughly and the opinion of an experienced military transport officer obtained on the quality of the animals estimated as being procurable.

Also similar estimates regarding hired carriage would have to be forth coming, and rate of hire stated, with a confidential report as to whether the inhabitants would freely furnish animals and whether men would freely volunteer as drivers or whether a certain amount of compulsion would be required.

Employment of carriage with regiments during Peace.

During peace time the available permanent carriage would be attached to regiments during all marches and for a certain time every year for drill and manœvre. Regiments would be more experienced in the marching essentials on active service if they usually changed stations

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by march route, and by marching in peace, instruction and employment would be furnished to the transport as well as to the regiments themselves. Such peace marches might profitably be occasionally made as if in presence of an enemy.

Other Employment.

When not thus employed, a portion of the permanent carriage might presumably be utilized by other Departments besides the Commissariat. Its employment in Government Bullock Trains would not appear usually desirable, at any rate in the vicinity of the frontier, as it would not be forthcoming, except by much inconvenience being entailed, at the time when it was most required for its legitimate duties.

Office work and Returns.

A certain amount of registration and office work generally, must be carried on even during active operations, however adverse the circumstances in which the Transport Director and his Staff and other officers find themselves placed. As much of the office work, as possibly admits of it, should be carried on by means of carefully prepared printed forms. These forms might be in books with counterfoils when requisite. All Transport Officers should be provided with such forms and instructed in the method to be adopted in Correspondence. Certain among the superior transport officers should have the assistance of one or more clerks, or writers. All forms, and methods of keeping accounts should be the same in time of war as those used in peace. If the same forms cannot be made applicable, then they should be as little unlike the forms, whose place they take as possible, and no form in peace or war should be elaborate, or contain any information not absolutely required.

Rations and Ration Indents.

If the drivers have to pay for their own rations during war, and the owners of hired cattle for the grain used by their cattle, then a simple form of ration indent becomes necessary, so as to have a record of the rations supplied to men and animals by the commissariat. Even if granted free rations and forage, such indents must be prepared ; but inthis case the form of indent may be much simpler. The preparation and checking of ration indents is no small portion of the daily work of the transport officer, and rations should usually be drawn for two or three days in advance at least.

Suggested necessary returns, records, etc.

As a suggestion regarding necessary records, and documents requiring to be kept up by all transport officers in charge of animals, in order to ensure justice to the drivers, fair payment of their hire to the owners and economy in the disbursement of government money and supplies, the following will presumably be found useful, and necessary even in war.

A daily report book or journal.
A casualty report book.
An acquittance book.
An order book and letter book.

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A memorandum book for noting on the spot all transactions and requirements.

Forms for such books, shewing by printed headings the information required, as well as for other documents which may be found to be necessary, might with advantage be prepared by a committee of officers who have had experience in the working of transport during recent campaigns. The same committee could be directed to draw up a code of regulations for land transport, in accordance with general instructions which would be issued for their guidance.

Example of mobilization.

To make more evident the method of mobilization proposed in the transport organization which has been the subject of this essay, the writer will proceed to elucidate its working by an actual example. Let it be assumed that the situation is such as occurred in India in September 1879, after the murder of our envoy at Kabul, and that the station selected for this example is Secunderabad in the Deccan. Here it is deemed necessary that a movable column consisting of a half battalion of British Infantry, a squadron of British Cavalry, a squadron of Native Cavalry, a battalion of Native Infantry, a Heavy Battery and a half Battery of Horse Artillery should always be ready to take the field. Consequently carriage, at least sufficient to move the force above mentioned, must be always retained. At the time of receipt of the order for mobilization of the Government carriage at Secunderabad, let us assume that small manœuvres are being executed and that each regiment is in possesion of as much carriage as can be spared to it for drill purposes—the carriage being under the regimental transport officers and their subordinates, only a small proportion being retained at the general transport depôt in charge of the staff superintendent of the division or station. On receipt of the transport mobilization order, the general promptly suspends all drills and manœuvres requiring transport, and directs all transport animals, carts, and drivers to be returned to the general transport depôt at once—also that all officers (including regimental transport officers) and non-commissioned officers are to report themselves to the Quarter Master General or Station Transport superintendent for duty, as they may be required. This superintendent in communication with the transport director at Madras army head quarters, proceeds to carry out the general instructions for mobilization. He knows that in his vicinity mules are not procurable, and camels only in small numbers. Elephants are not required for the operations contemplated, but ponies and bullocks are procurable in any quantity from the people of our ally the Nizam of Hyderabad, and good prices being paid are brought in at once. All available regimental transport officers with their assistant N. C. officers under the orders of the Station superintendent and officer of the Quarter Master General's department are busily employed for three or four days selecting and putting aside eligible animals. A final board unconnected with the transport department passes animals they consider fit among those thus selected. These animals are at once branded and become

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Government permanent carriage. Then the old troops of animals are broken up into their component four sections and the new animals drafted into them for fitting gear and for training to pack and harness work, if not already so trained. The services of all officers who have been trained to transport work having been put into requisition, it may be assumed that every effort to attain efficiency will be made. The director or his staff officer makes an occasional inspection and reports to the director general for India what progress is being made. In about three weeks or a month, having been inspected by the general, or other officer he may appoint, three-fourths of the mobilized transport with the necessary proportion of available British and Native transport superintendents and subordinates in charge of it, is ready for despatch by rail or ship to the seat of war—there still remaining one fourth, equal in numbers, although possibly not so in efficiency, to the establishment existing before the mobilization order came. The Commissariat have had no hand in the matter beyond supplying the drivers and animals with food if required, and using their best endeavours and time-honoured influence to induce owners to bring in their animals, and to enlist drivers. In the case of a place so distant from the seat of the present Afghan war as Secunderabad is, it might not be considered advisable to entertain hired transport; but for an example let us assume that steps similar to those sketched have been taken at Rawul Pindee, and that sufficient animals have been purchased, old drivers called in for service, and new drivers engaged. It is deemed advisable to raise a hired transport as well. The civil authorities and the Commissariat give their assistance, and animals for selection begin to come in. Certain transport officers, non-commissioned officers, and subordinates are told off for the organization of the animals among them considered suitable. Registers are opened, and documents, as previously proposed given to the men, and the organization is otherwise completed. This hired transport will be fit for service at the same time or possibly sooner than the purchased animals, if no difficulty is experienced in collecting animals. Necessary regulations should be read and explained to all followers, and a few of the permanent carriage subordinates should be attached to the hired branch, to instruct them in such matters, as well as to assist in the discipline, and simple drill necessary.

Conclusion.

The writer of these roughly put together remarks and suggestions regrets their many shortcomings; but hopes they may be found by officers, more experienced than himself, to contain at least some germs, conducive to that much sought for improvement in Asiatic transport, for lack of which commanders of Indian armies, during many campaigns, have had to run risks and encounter difficulties that they otherwise would have been exempt from.

BELLARY, 1*st May* 1880.

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EXTRACTS FROM ESSAYS

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE."

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I.

EXTRACTS FROM AN ESSAY

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE,"

BY

LIEUTENANT COLONEL C. A. SIM,

Royal Engineers

"HORATIUS"

"Droves of mules and asses"
"Laden with skins of wine,"
"And endless flocks of goats and sheep"
"And endless herds of kine,"
"And endless trains of waggons"
"That creaked beneath the weight"
"Of corn-sacks and of household goods,"
"Choked every roaring gate".

Macaulay's *Lays of Ancient Rome.*

The writer of this paper, after quoting some eminent authorities such as Napoleon I, Sir Chas. Napier, Sir John Burgoyne, Sir John Kaye, Clements Markham, &c., &c. proceeds to shew that the experiences of the past century in wars, both European and Asiatic, afford abundant proof of the truth of the maxim of the renowned Napoleon that "the" "utmost skill on the field of battle is wasted unless accompanied by" "careful attention to military administration".

Examples are taken from the wars of the Revolution, the advance on Kabul by the army of the Indus in 1840-42, the Crimean war, the Abyssinian Expedition, and though last not least, the Afghan wars of 1878-80.

Though the earliest improvements in the system of transport took place as far back as the French Revolution, and have been followed by several of the continental nations at various later periods; nevertheless the subject had received little attention in the English army and was but very imperfectly understood when, after a quarter of a century of peace, the truth of Napoleon's maxim "*Quand une nation na pas de* "*cadres et un principe d'organisation militaire, il lui est bien di-* "*fficile d'organiser une armée*" became painfully manifest; of this the

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accounts of the advance on Kabul in 1840-42 afforded a melancholy illustration.

To the want of a properly organised system of transport Kaye attributes the enormous expenditure of life and money during that war; 20,000 cattle died between Ferozepore and Kandahar, and in one batch of camels above Rs. 44,000 had to be paid for demurrage before they were even seen by our commissariat officers.

The opinions of Sir Charles Napier are quoted because his Scinde camel baggage corps, costing about Rs. 20,000 per month, instituted in 1846, was acknowledged by all to have more nearly solved the much vexed question of transport than any scheme hitherto proposed.

Briefly his reasons for its establishment were:—

(I). That an Indian army requires more baggage than any other army in the world.

(II). That the Europeans of an Indian army require more baggage than any other part of that army.

(III). That the officers carry a great deal more baggage than is necessary, and that the private sepoys comparatively collect more than the officers.

(IV). That as the climate renders a great deal of baggage necessary, care must be taken that in a trial to reduce the quantity of this great impediment to movement, we do not over-reduce and create suffering. The line which divides necessaries from luxuries must be drawn with much care, for in India, luxuries and necessaries are near akin, especially among Europeans.

(V). That all the baggage for war should be much less than that allowed in peace.

(VI). That all private baggage should be carried by public carriage, and no private carriage should be allowed in the field.

So far Sir Chas. Napier shows that the question of baggage is of so much greater importance to an army in India than to a force in Europe, as, by reason of its composition and the nature of the country, an Indian army must be, to a certain extent, sufficient unto itself.

But another great argument in favor of an organised baggage-corps is put forward, when, speaking of the attacks so frequently made on baggage-trains, Sir Charles Napier says: "In case of necessity a power-" "ful defence can be made, when once the baggage of an army becomes" "organised; and why its organisation should be neglected in India, I do" "not know. But all know this, that in work of all kinds, and most in" "soldiers' work, the division of labor and methodical proceedings"

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"will produce the greatest results, results which will be in proportion to" "such methodical arrangements."

Having recommended that a sufficient establishment be kept up in peace times he says "with regard to increasing the corps when war" "is expected, the Government would merely make a temporary addition" "by:—

I. Hiring camel men.
II. Purchasing more camels.
III. Attaching a few more officers for the campaign.

"This temporary increase would be determined by the strength of" "the force with which it is proposed to take the field. The additional" "officers would be but few, and the Government must eke out the" "strength of the corps by hiring as many drivers as may be required."

"This, at first, appears an abandonment of the principle on which" "I formed the corps, but it is not so, for by attaching one hired camel" "man and one camel to every regular soldier camel driver of the corps," "the hired man is forced at once into a strict compliance with the" "system of the regiment which only requires obedience to orders, that" "is to say, discipline, not drill."

The valuable experiences of our army in the Crimea are, in the words of Sir John Burgoyne, narrated as follows:—

Crimean War.

"With regard to Land Transport, the difficulties in the way of" "collecting and maintaining any amount that" "would have been of sensible utility were" "enormous, and indeed may be understood by the slow progress and" "still imperfect state of the present provision, after twelve months" "exertions, with ample funds and every possible means at work for it." "Nine tenths of the evils of the army were attributable to want of" "transport. In treating of transport animals it is said that there were" "means of procuring and conveying them to Balaclava, but it is very" "questionable whether this was the case. The drivers were very" "insufficiently cared for, nearly always overworked, and not unfre-" "quently left without provisions for themselves, or forage for their" "cattle. I would suggest to remedy this, that as many drivers as are" "wanted for constant and specific services should be permanently allotted" "to those services. The animals for transport are habitually provided" "by the Commissariat, a most inconvenient and improper arrangement."

Abyssinian expedition.

Although "par excellence" a war of transport, the Abyssinian expedition has added little to our information on the subject, and Clements Markham in the history of this war writes:—

"The organization for this campaign was commenced too late," "there was no nucleus to work upon, no reserve to draw from, and when" "supply was found, it was totally untrained."

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"The task of the Abyssinian expeditionary force was to march"
"400 miles in a mountainous and little known region to Magdala."
"The force was composed of:"

13,883 fighting men.
2,306 coolie corps.
3,233 followers.
12,640 transport train.

"It was evident that the movements would be mainly dependent"
"upon the supply of mules, and that a vast number must be imported,"
"forming a transport train and requiring good organization."

"These were obtained from India, Spain and Egypt. The Spanish"
"animals were for draught, and quite unfit. Those from Syria proved"
"excellent; but the mules from Suez were without pack saddles or"
"other equipments,—the halters were of rope instead of chain, the men"
"sent as drivers were the vilest sweepings of Eastern cities, and the"
"great majority of them deserted in a body and went to Massowah."

"The animals, left without attendance of any kind, began to die"
"by scores."

"There was not a proper pack saddle in the country, and not a"
"man who knew either how to load or drive a mule. Nor did any one"
"acquire that knowledge; and it must be earnestly hoped, that none"
"of the methods of loading and driving mules practised in Abyssinia"
"will be retained as traditions for future use."

Afghanistan 1878-79.

To approach more recent events, the incidents of the late Afghan war, in its earlier stages, have proved that too much dependence was placed on the supposed unlimited supply of camels in the Punjab, and that very little was practically known of their habits. The fact of a camel possessing seven stomachs was traded upon to an enormous extent and the animal was often not supplied with water enough to meet the needs of one. They had seldom enough food, and were never allowed their quantum of rest. The variations of climate necessitated great care, and the want was severely felt of men with a stock of medicines, who understood and could treat the ailments of camels, ponies and bullocks; for in the event of sickness the weaker animals usually died, and a double burden fell upon the stronger ones. A small expenditure in jhools, barrels of grease for the axles of carts, and timely shoeing would have converted an experiment into a success.

Thus far past experience has shewn the shortcomings and defects of a transport system, but there remains the solution of the question—How best can be organised a transport service for Asiatic warfare?

The desideratum in a transport service for Asiatic warfare points to the necessity for the formation of a head-centre, the nucleus of which

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must be in India; out of India agencies must be established in the Persian gulf, Arabia, Ceylon and China; the administration must be entrusted to the staff of the Indian army.

Times have considerably changed since the days of Semiramis and Alexander the Great, and recent experience has shewn that the very countries through which the latter marched his enormous armies could hardly support the compact armies of the present day.

Yet it is certain that like all barbarian conquerors Alexander carried back with him, in addition to his own supplies, the richest treasures of the conquered countries.

In those days the years of campaigning were sufficient to perfect any system of transport, the resources of the country were adopted as best they could be, and temporary failures merely meant sufficient halts to organise some other plan.

All this, however, is a thing of the past, and in the present age that nation which can mobilise its forces in a few weeks, can wind up a campaign in a few months; and not to be so prepared for war means, in these days, dire disaster.

To the writer of this paper the system of movable columns commends itself as capable of much expansion.

The head quarters of each army corps would form the head and centre of its own transport service, extending its ramifications into the various divisions, brigades and smaller commands.

From the experience of past campaigns only one writer recommends "the land transport to be a mere subordinate branch of the Commissa-"riat." But such an eminent authority as Sir John Burgoyne has declared that "this particular service should, above all others, be" "performed by the military, and that the greater portion of military" "transport should be complete when the army takes the field, as a" "distinct corps, with proper responsible officers."

On these premises the constitution of the proposed distinct transport department to be added to the staff of the army is described, and exemplified by the disposition of four army corps over the area of country approximately shown in the tracing attached to the original essay, on which the black letters shew the distribution of the army with its necessary transport to take the field at any moment.

The details of the transport are explained in the appendices; the sum total of the transport would equip the four army corps complete in camp equipage, baggage and regimental reserve of ammunition, with 4 days' supply of provisions.

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The severance from the ammunition is said to have the advantage that, beyond this 4 days' supply, the ammunition would take up the place of food; in a similar way the transport service for the engineer park would feed the company equipment of service companies; and the artillery reserve would supply the army generally with spare ammunition.

In this manner taking a regiment, a battery and a company of sappers as each a unit for the several arms of the service employed, it is shown how a regimental system of supervision would be established for the whole army at large, as is now practised specially for the frontier regiments of the Punjab Frontier Force only.

Each frontier infantry regiment has the following transport permanently attached to it under the order of the commandant, viz 40 mules, 55 camels with an establishment of 1 jemadar and 13 syces for mules, and 1 jemadar and 11 surwans for camels; and the elaboration of transport details has been carried so far that 16 mules' loads of ammunition are always kept ready packed in the regimental magazine.

This is the reserve ammunition at the rate of 60 rounds per man (40 per man being carried by the sepoys in their pouches).

The cattle establishment is supposed to be sufficient to move a wing in very light marching order.

As an illustration of the mobility of the force under this system an instance is cited where, during the Jowaki raid in 1877, the 1st Sikhs were on the move within 3 hours of the order, the extra transport being obtained from the second regiment at Kohat.

Regiments being thus supplied with their transport (under the commanding officer's responsibility), regimental arrangements would be made for its maintenance and efficiency. The regimental representative would report to the Brigade or divisional transport staff officer, and in the event of such transport not being for the moment required would comply with such demands or requisitions as might be made on him for work in the station or elsewhere.

Such a system was attempted in Afghanistan in 1878-79, but no actual distribution was made amongst regiments, and the responsibility ceased.

The whole of the transport was herded together, there was an insufficient establishment to look after the details of the work and the feeding of animals, and enormous losses naturally resulted.

The writer looks upon regimental transport as important to an army as horses are to artillery and cavalry, and considers it should be cared for accordingly by those most interested in its efficiency.

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The transport of an army would, in this manner, be divided into

i. Transport for the staff
ii. „ „ regiments.
iii. „ „ commissariat.
iv. „ „ artillery reserve.
v. „ „ engineer reserve.

The administration would be conducted by a separate transport staff (a Brigadier General for the Head Quarters of the army) ranking downwards as the Adjutant General's and Quarter Master General's departments, according to their different commands.

In times of peace their duties would be two-fold :—firstly superintending the exercise of the several movable columns ; secondly regulating and inspecting the different sources of supply in their transport areas.

They would be constantly engaged in checking every detail for the improvement of transport, and in proposing plans to reduce the enormous waste of life among baggage animals in time of war.

The money saved by such attention and supervision would, in the long run, balance the expenses of the new establishment.

The writer deems it injudicious to lay down any hard and fast rule for establishments suitable for each part of India, as the proper constitution of the new department can only be arrived at by degrees; he, however, condemns the present system of hired camels where one surwan owns and is supposed to look after 3, 5, 7 or any number of beasts he chooses to bring into the field ; and recent experiences go to prove that 1 driver had charge of 8 camels, while the Punjab Frontier Force transport allows 1 to every 5 animals.

It is argued that an expert could soon fix the work one man could do efficiently, and the writer thinks that, in peace times, half the war establishment would suffice, on the lines suggested by Sir Charles Napier, viz. 1 attendant to every two animals.

With regard to movable columns the writer observes that in many stations in India such exist only in name, but that a transport service for war must be practised in peace, and that a sufficient supply should exist in each station, for constantly practising the three arms of the service in marching out.

No luxuries of large tents should be admissible; the packing up, the loading of baggage and equipment require constant pratice, and on such occasions it would be advisable to reduce the number of followers to a minimum, even to leaving behind native cooks and trusting to camp kitchens under the immediate working of the men themselves.

He considers it advisable, in view to the most efficient equipment being laid down, that a standard pattern tent, table, chair, bed and pack

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as well as mess kit should be fixed for campaigning, and to see that all are efficient and ready for use in the field at the shortest notice.

Having shown the way in which it is proposed to organise a system of transport, the writer dwells at some length on the different descriptions of transport usually employed.

The author also shews briefly in what direction steps should be taken to adjust the minimum of labor to the maximum of load, with reference to the various means of transport enumerated.

He enters into the subject of pack saddles, and the conclusions drawn are that as in a transport service a great variety of loads is certain to be the rule, and that "pad" or "pack" must be decided upon which is easiest of adaptation to all requirements.

The writer holds that even on considerations of economy, which now a days carry such weight, war should be short, sharp and decisive, and that to attain these ends the true art of war must be learnt in peace time, and considers that each day should see some preparation matured, some new choice completed and some decisive steps taken towards perfecting every means at hand for gaining the victory.

To this end he considers that the transport akin to other branches of the service should always be thoroughly efficient for any and every emergency, instead of having to be recruited when war is at our doors.

He concludes by saying that it matters little whether a transport service be regarded as an accompaniment to an expedition against wild tribes, or to march with the army which, at some future time, will measure its strength with the highly trained and civilized troops of Russia in Central Asia; its constitution must still be the same, the result of much thought, much labor and much careful organization in times of peace.

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II.

EXTRACTS FROM AN ESSAY ON "A TRANSPORT SERVICE FOR ASIATIC WARFARE"

BY

LIEUT. COLONEL G. W. H. HOGGAN B. S. C.,

—o—

"Tiyar ho."

1. To make such a Transport scheme practically useful, the following table is taken as an approximate and tolerably correct standard for an Indian division, from which the transport requirements for the whole army may be ascertained. This is, however, without taking into account every *minutiæ* or the extra staff on active service with its numerous departments and establishments which would be dependent on the objects aimed at by the campaign, its season and duration, the obstacles to be encountered &c. Also without taking into calculation certain items in the general staff, such as the treasury and ambulance corps &c. which can but be vaguely calculated, and without fixing any limits to the extent of transport for ordnance and miscellaneous stores. No allowance is, moreover, made for pontoons and siege trains, field, mountain, elephant, and garrison batteries, which are special appliances. In fact what is desired is not so much the precision of minor details, as an approximate register of every legitimate demand on this transport service.

2. The calculations are based on the following scales.

(*a*) One general servant for every officer.

(*b*) One tatt, One syce, One grasscutter } for each officer's charger.

(*c*) One tatt, One grasscutter } for every dismounted officer.

(*d*) One grasscutter to every two tatts for all messes save the brigade staff mess, which latter would, it is presumed, avail themselves of some mess in their respective brigades.

(*e*) One tatt, One grasscutter } for every officer.

(*f*) Hospital establishments are exclusive of dooly bearers, to be arranged for in the ambulance corps.

(*g*) One grasscutter to every two horses, and one tatt to every two horses in the Artillery and European Cavalry.

(*h*) One grasscutter, One tatt } to every two horses in the Native Cavalry.

3. With regard to European officers arranging for their private carriage, with which this scheme has nothing to do, it is recommended that the entire army be assimilated in this respect with the Bengal Cavalry system (its native portion) by which the saving, in its application to only one division during a six months' campaign, would be Rupees 40,332.

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		Military.			Camp followers.		Tatts.	
		Horses.	Rank and File.	Officers.	European Offrs. private.	Regtl. public and private.	European Offrs. private.	Regtl. public and private
General Staff		54	0	115	362	0	193	0
Sappers, 3 Companies	European ...	6	18	12	48	6	27	0
	Native ...	6	342	0		111		175
Artillery, 3 batteries		21	471	540	123	321	57	249
Cavalry Regiments	1 European ...	27	456	511	150	354	68	368
	2 Natives ...	44	1080	1,144	106	718	48	658
Infantry Regiments	3 Europeans...	96	2655	15	249	657	138	855
	6 Natives ...	150	5496	54	192	1,304	84	1,728
		404	10,518		1,230	3,471	615	4,005
Grand Totals		10,922		2,391	4,701		4,620	

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5. The several totals multiplied by the daily amount of provisions and grain

10,922	(military)	× 5 lbs	=	54,610	lbs.
2,391	(horse)	× 8 „	=	19,128	„
4,701	(camp followers)	× 3 „	=	14,103	„
4,620	(Tatts)	× 4 „	=	18,480	„
give a total of				1,06,321	lbs.
or				... 1,329	mds.
requiring for its carriage, ...				655	Tatts.
or with 15 days' provisions and grain,				9,975	„
which with 10 per cent. for casualties would be				10,972	„

6. This is without taking into account grasscutters for the tatts or for provisions and grain for both, as the extra weight for these might be easily added without overburdening the animals whose weight has, in view to this contingency, been taken at only 2 Maunds for Tatts

or	„	4	„	„ Camels
or	„	8	„	„ 2 Bullock } Hack-
or	„	16	„	„ 4 „ } eries.

7. To this total of 10,972 tatts has to be added, on account of public carriage, 3,439 tatts with 10 per cent reserve, or 3,782 tatts, which would give a grand total of 14,754 tatts to be supplied by the transport service.

8. In view to economy, and to a ready contraction in peace and dilatation in war, the scheme may be divided into *permanent* transport, or what is required for ready movement and to keep the army going, and *temporary* transport, or for carriage of provisions and grain—the former being entirely composed of mules or tatts which, after first supply from the studs by means of station committees, would be under regimental supervision; and the latter of camels and hackeries obtained through the civil authorities and settled for by the commissariat.

9. The *permanent* transport or regimental public carriage for a division is taken at 3,439* tatts, which with 10 per cent reserve for casualties, would be 3,782 tatts, and all correspondence connected with their expenses should go to the Stud Department, the animals being under the immediate charge of squadron and wing commanders. Reports of present States should be sent weekly to General Officers Commanding and monthly to the Quarter Master General.

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* Sappers, Native 147
Artillery 249
Cavalry { European 368, Native 92
Infantry { European 855, Native. 1728
} = 3,439 tatts.

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10. Their grazing should be arranged for by cantonment committees.

11. The full complement need only be supplied to frontier regiments; corps near good roads and railways, should take wheeled carriage and the train.

12. Commanding officers should, in quarters, be allowed to use public cattle on payment, crediting recoveries.

13. The approximate monthly cost for the movement of a division would then be 3,782 tatts × 2 seer grain = 7,564 seers which @ 10 seers per rupee = 756 Rupees or Rs. 22,780 per mensem; 1891 grasscutters (being half the number of tatts)

@ Rs. 6/=	11,346
Total Rupees	14,126

Exclusive of purchase of cattle gear, which ought to be of one pattern and supplied by the Stud Department, salootries' wages, medicines &c.—

14. The extent of the *temporary* transport under the Commissariat, to carry 15 days' provisions and grain for a division, has already been noted above—para 5—and for it camels, bullocks and buffaloes ought to be used, and when practicable hackeries and wheeled carriage.

15. The celerity of the mule will not be in such requisition here, but for special movements each division should always be accompanied by 150 mules capable of carrying some 300 maunds over difficult ground; they should be supplied by the Studs and be under the Divisional Quarter Master General in the field.

16. For grazing &c., the Hissar Farm would be a good locality for camels &c., and Julpigoree or Cooch Behar for buffaloes—the breeding should be under the Stud Department.

17. The manufacture of carts should be entrusted to the Postal Department.

18. Without defining exactly the extent to which camels &c., are to be arranged for, the numbers may be taken at half the number of tatts—see para 7 above—or 7,377 camels, which had best be divided into 3 classes for the weight to be carried, viz 1,329 maunds daily, or for 15 days, 19,935 maunds thus:—

6,645 ($\frac{19935}{3}$) Mds. each,	Camels,	1661
	Pack bullocks or buffaloes	3323
	Carts,	830

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or a total number of 6,644 animals (reckoning 2 bullocks to every cart), for feeding which @ Rs. 8 per mensem, the cost would be Rs. 53,152: adding to this

{the wages @ Rs. 6 for 1107 surwans, *i. e.* 1 to every 6 animals,

the sum would= Rs. 6642—making the grand total of expences= Rs. 59,794.

19. The hire &c., of these animals should be settled through the commissariat, which will also have charge of all government animals made over by the stud department.

20. The total cost of both *permanent* and *temporary* transport would thus be (34,126+59,794) Rs. 93,920, or about Rs. 95,000 per mensem for a division.

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III.

EXTRACTS FROM AN ESSAY

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

BY

MAJOR GENERAL J. M. MACINTYRE R. A.

"May good transport prevail"

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1. The transport to be kept totally distinct from the commissariat.

2. To be formed with a few European commissioned, warrant and non-commissioned officers; and under them native non-commissioned officers and privates.

3. A transport department to be kept up at all large military stations, with a detachment attached to each corps.

4. A commissioned officer, not the quarter-master, to be in charge of transport of each corps.

Railways.—Troop sidings to be laid at each large station. The writer enters into details as to the mode of embarking guns, horses, stores &c.

5. *Elephants.*—Where and when useful.

6. *Camels.*—The Bactrian the best. Mode of distribution according to nature of the camel suggested.

7. *Mules.*—Pack saddle for—the Punjab pack the best.

8. *Bullocks.*—Pack, useful in traversing country paths.

9. *Carts.*—The best was that attached to the Sardinian army in the Crimea.

10. *Bullocks.*—The best is the Mysore—breed has not been kept up.

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11. *Establishment of animals.*—Depôts to be kept up, and also a reserve by giving a small retaining fee to owners of cattle; drivers to have uniform, this would prevent desertion.

12. *Brinjaris.*—Most useful in the old campaigns and are still available.

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IV.

EXTRACTS FROM AN ESSAY

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

BY

BREVET MAJOR G. A. FURSE D. A. Q. M. GENERAL,

"Omnia vincit labor."

This essay commences with an allusion to the costliness of past campaigns, one of the chief causes of which, the writer considers, was the nature and extent of the transport service. Owing to the impedimenta being on an extravagant scale, and to the want of previous preparation, the cost of this service has been greatly enhanced. The results of postponing the organization of the transport until the last moment are,

(1) that there is great delay in the commencement of operations against the enemy;

(2) that higher prices have to be paid for animals;

(3) that the selection of animals is hurried and unsatisfactory, resulting in much mortality and expense in compensating owners.

During the Abyssinian campaign and the recent Afghan wars, the mortality amongst the animals was immense and was due, in the writer's opinion, to the causes already stated, as also to the inexperience of transport officers, insufficient supervision, the working of weak animals for want of others to replace them, overloading, cruelty, and to the neglect and dishonesty of contractors and drivers.

The conditions of warfare in Asia demand a transport totally out of proportion to the number of combatants, (1) on account of the difficulty of obtaining supplies in the countries operated in, necessitating a magazine system of commissariat; (2) owing to the absence of suitable roads for wheeled carriage, &c., demanding a pack train of considerable dimensions; (3) because the objective is far removed from the base of operations; (4) owing to the large body of non-combatants who require to be fed; and (5) on account of the extravagant allowances in the way of impedimenta.

The two last causes the writer considers open to considerable improvement, and suggests that they should be remedied.

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The contract system, and the plan of organizing a special transport, on an emergency, have both hitherto, proved unsatisfactory and failures; and the only plan of carrying on a campaign, in a satisfactory and economical manner, is, in the writer's opinion, the establishment of a permanent transport corps, capable of rapid expansion. Having regard to the enormous amount of money expended in land transport during the past 20 years, both for military operations and famine relief, and comparing the total expenditure with the cost of keeping up a respectable nucleus of military transport during that period for use in time of emergency, there can, he states, be little doubt which would have been the more economical. The movable column carriage maintained at present does not, he points out, answer for a nucleus, being devoid of any military character whatever and having no special organization.

Much time would be saved in the commencement of operations by the adoption of the German system of employing staff officers, in time of peace, in solving war problems, in staff journeys and visits to foreign countries, and relieving them of routine work. Thus, besides the most favorable plan of campaign, are worked out the means by which this can best be carried into immediate execution By these studies would be ascertained the difficulties to be overcome in the various eventualities likely to arise, the strength and composition of the force to be employed in each case, the total amount of supplies and material needed, where best to collect them; the most suitable kind of transport, where to procure it, and the best means to obtain it.

The writer advocates, as the first measure of importance, the appointment of a staff officer on the Head Quarters Staff as a director or inspector of army transport. No additional officer is, he considers, needed, as one of the officers of the present staff could easily be set free for this duty by relieving him of routine work and matters purely of detail. This officer's attention should be directed to the study of military transport in all its bearings, and to the requirements of an army in all the Asiatic countries in which it may be called upon to operate. He should also superintend the regular transport maintained in peace time, should prepare for its expansion, concentration and allotment on the outbreak of a war, and should also select, out of the transport of the invaded country, the most suitable for employment in aid of the regular one. He would estimate and prepare before-hand for every case likely to occur, considering all questions connected with purchases, scale of forage, rations, clothing, pay, duties, &c.; he would frame tables of organization for permanent and auxiliary transport, and prepare regulations for issue to all transport officers as a basis to work upon; he would ascertain the names of the best contractors for carriage, harness, &c., and keep specifications and patterns of the best material; he would attend specially to the instruction of both officers and men and the formation in peace time of a reserve of both.

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The writer considers the present a fitting opportunity to establish our military transport on a proper footing, entrusting the duty to some officer who during the recent operations has shewn a special aptitude for such work.

To meet the cost of a properly organized train, in peace time, which, as above stated, the writer considers necessary, he suggests that the Indian army might be slightly reduced, thus removing a portion of the financial objection to the establishment of such a train. The present movable column carriage might be utilized as a basis for the formation of the train, altering its organization so as to make it available for use alike in India and abroad, and using it as a training school in time of peace.

All regiments on the frontier, particularly in troublesome parts, should keep their regimental transport complete at all times, the expense being partly met by using it for collecting and transporting supplies and for other work. There would thus always be a respectable force ready to take the field with the transport it needs for regimental wants.

The departmental transport would be furnished by the military train, which the writer proposes to maintain in peace time, divided for work between the large military stations. With the concentration of the troops for any intended operation, would be concentrated a certain number of companies of the transport train, each complete in organization and the whole placed under an efficient directing staff. The companies would in peace time be maintained on a reduced establishment, a reserve of drivers and animals being provided for, as hereafter explained, to place them on a war footing when necessary, and additional transport being hired for local duties when the regular transport attached to a garrison is found insufficient.

With regard to the organization of the military transport train, the writer suggests that the companies should be kept distinct, somewhat on the same footing as the R. E. companies, the company being considered the unit of organization in ordinary times. Each should be commanded by a major, who, on promotion, should be transferred to a more responsible command in the infantry or cavalry. The companies should be independent of any corps head quarters, and, for administrative purposes, should be entirely under the staff officer, director of transport. When two or more companies are serving together, the senior officer would assume command.

In peace time each company might consist of a permanent cadre of European officers and of native N. C. officers, with subaltern officers and rank and file attached for duty. The permanent officers and men would receive the corps pay and allowances; the attached officers their regimental pay with horse allowance, the rank and file being allowed a slight addition to their regular pay. A reserve of drivers might be

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secured by limiting service in the permanent transport to the time necessary to thoroughly instruct the men, who would then be sent back to their regiments to complete their army service. The same rule should apply to the regimental transport services.

These officers and men would be available to raise to war strength the permanent transport companies and to form cadres for the auxiliary transport. The selection of men for the transport corps should be chiefly confined to soldiers belonging to carrier castes and to those who in civil life, have had to look after draught or pack animals, and every man should be a thoroughly trained steady soldier, to be selected in the early part of his career.

The officers attached to the transport companies for instruction should be taken from every branch of the service, only subalterns, however, being chosen, to prevent their becoming early ineligible for employment by attaining field officer's rank. The permanent officers would be selected solely from those who have undergone a regular training and shewn a special aptitude for this service.

The employment of native commissioned officers is not recommended, as they are generally old. The proposed arrangement would reduce each battalion by from 10 to 20 men attached to the transport corps for duty and instruction; they would be retained on the rolls of their regiments until promoted to N. C. rank, when they would be brought into the permanent rolls of the transport corps; and deserving men promoted to commissioned rank in other regiments. By dispensing with the Inspectors, &c., now looking after the movable column carriage, the means may be provided for the pay of artificers &c. required to keep the harness and material in working condition.

The writer sees no reason why transport officers should expect a higher rate of remuneration on service than other combatant officers doing duty with their regiments.

He thinks we might with advantage follow the example of some of the European military powers, by passing an enactment enabling the state to impress transport animals and carriage in time of war if needed, the owners receiving a fixed amount with reference to the class of animal, breeding, age, description of carriage; the amount to be fixed by a mixed civil and military committee. If the demand is only temporary, the owner would receive an indemnity for the loss incurred by the temporary deprivation of his property. A census should be taken of all the animals maintained for draught and pack purposes, carts, waggons &c., and the demand regulated to suit the resources and needs of each particular district. Failure to comply with the provision of the law should be punishable by a heavy fine.

With the census, the owners would, in anticipation of hostilities, be called upon by district officers to produce the stock of a certain descrip-

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tion and age for selection, which if the war broke out only would be purchased. The evils of the present practice of denuding the provinces nearest to the scene of operations of animals to a serious extent, might be avoided.

The writer adds that by devoting increased attention to the breeding of transport animals in India, large purchases of animals in foreign markets would be avoided. Officers of the permanent transport train should be required to assist in this, as part of their regular work; and with each Co. a few good, powerful stallions might be kept for breeding purposes.

The permanent transport should be constantly weeded, only young, robust animals being retained and aged ones being sold yearly before they are quite unfit.

Of the different kinds of transport animals, the writer considers the mule the most suitable, as it is equally good for pack in hilly country and for draught, and it should therefore, he states, be largely used in the permanent transport. The advantages of the mule are that it will work longer than the camel and the bullock, it stands a journey by sea well, is easily conveyed by rail and is not affected by any sensible variation of climate. But it is more expensive to purchase and to maintain than other animals. In China and Abyssinia, the mule trains were considered the most efficient portion of the land transport. The encouragement of mule breeding is, therefore, strongly advocated.

For such parts of the countries out of India, where wheeled transport can be used, the writer considers the two wheeled cart preferable to the four wheeled waggon, as being able to move over worse ground than the larger waggon, and more easily packed on boardship. The American army waggon, he states, is highly spoken of, but it is doubtful if it would suit the narrow and uncared for roads of many Asiatic countries, as well as the two wheeled Maltese cart, which might be made to carry double the load and be drawn by two mules when the roads will admit of it. The Indian bullock hackery, which can be obtained in large numbers in any part of the country, is cheap, light, sufficiently strong and easily repaired.

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V.

PRÉCIS OF AN ESSAY

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE,"

BY

LIEUT. L. E. B. BOOTH 33RD FOOT.

"PALAN."

Keeping in view the axiom that "the greater the carrying power, "and the fewer mouths to feed, the more efficient is the transport service," the writer considers it a *sine qud non* of organization for such a service that it should be suitable in itself for times of peace and susceptible of expansion to meet all the requirements and strain of war without unduly straining the resources of the country.

Assuming that the nature of the country a transport service has to be provided for, and the means at our disposal are fairly known, a system is required, moulded to overcome the natural features and climate of the country, by using the material to be obtained, and of obtaining and applying the same.

The physical features of a country for which transport has to be provided are considered important factors in the consideration of the nature and description of transport to be employed, as each locality, by reason of the peculiarity of its nature and its resources, requires a different class of transport appropriate to the varying circumstances of the nature and climate of the country; each class, viz steam, wheel, &c &c., being employed in its legitimate turn according to circumstances, taking the base of operations at the nearest point to our railways, canals, rivers or ocean as the case may be, still mindful of the axiom heading this note.

We have two distinct classes of transport, wheel transport and pack animals, the former to be used whenever the nature of the country permits, the latter taking its place when the former terminates, the object being to spare animals' backs as long as possible, besides making use of the most efficient transport, as an animal draws four times what he can carry, thereby at once increasing carrying power, a point which cannot be overrated, and should never be lost sight of.

The writer considers it of importance that each army corps in India should be able to move on service complete in transport.

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Although railways are the easiest and least expensive medium of transport for troops and stores, in the long run they are virtually more costly, as in the proportion they increase, country carriage decreases, except when commerce tends to give owners of animals some compensation for the outlay of breeding &c. which will soon be limited to (the amount of animals actually in existence being only sufficient for economical purposes) the work of getting goods to the line of rail or those actually required for agriculture, as owners will only keep enough live stock for their own gain, unless Government make it worth their while to breed and keep up the number of animals.

To aid and stimulate their efforts to this end, the writer considers, that breeding establishments must be kept up by Government and that owners of animals should be subsidised by Government and their carriage made use of for moving troops in peace times, for although every station has its quantum of transport for general station work, yet on service, when large numbers have to be taken care of, commissariat officers cannot do their own work and that of transport officers as well, without their numbers bring largely augmented, and an army service corps founded.

On these premises each army corps should have its Director General of transport and assistants, whose duty it should be to be thoroughly acquainted with the capabilities of particular provinces and outlying districts as regards the motive power peculiar to the locality.

The complement of transport, Government and hired, at each station now maintained should be kept up, having for attendants trained men, enlisted as soldiers, so as to be able to use a weapon in self defence. Every facility should be given to the regiments of each station for having men detached to supervise animals and their feeding; these would soon be found to take an interest in the work, and become thoroughly acquainted with the different ailments, and the mode of treatment to be adopted according to the nature of the case, besides noticing how easily saddlery gets out of order when neglected, and the consequences even in cantonments, therefore how much more so on service.

Each station should have its transport officers told off from regiments, who, with a certain number of men, should go through a course of training both as regards the care and loading of animals, a proper understanding of the latter being of the greatest importance on service in economizing space and motive power.

With this object they should be exercised in loading every class of transport and go through a regular course of drill, so that on service the mobility of the force would be ensured without any hitch.

This would form the basis of an organised transport service and each regiment would be prepared for service with a percentage of trained men for transport duties.

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In order to meet a sudden call it is indispensable the Director Genl. should know where and from whom and the amount of motive power he could produce if required. If the owners are subsidised by Government, which is the true transport system for India, they might, at any time, be called on either for service, to move troops in the District, or for flying columns, when troops would put into practice what they had been taught in quarters, the actual class of animal would be found out, and the proper uses of each.

It is essential also that a sufficient stock of gear should always be maintained intact at the different arsenals, and that carts, both light and heavy, should be employed for station work.

With a service organized thus in peace times, in case of a campaign the Director General should have at hand for his corps d'armée trained officers and men, efficient equipment, and adequate and appropriate carriage, motive power concentrated at the base from which his army corps forms and is moved, and a base of operations started.

Here a classification is imperative.

1*st.* the active line.

2*nd.* the line of communications.

3*rd.* the reserve.

As the line of communications increases the more must animals be saved, as an army advancing throws open military roads for wheeled traffic, and the pick of the pack animals must be reserved for the active line, so that in no wise is the advance of the force impeded, as, in consequence, the whole plan of a campaign might fail.

The Director General should appoint the Directors of each Division, one for the active line, another for the line of communications, and a third at the base who would push up transport as necessary; subordinate to them a staff would be formed of Veterinary Surgeons, Pay Masters and transport officers according to the number of animals.

As the force advances the Director General should select points for depôts placing a staff of subordinates at each, viz moochies, nalbunds, weighmen &c. establishing forage stores at each stage either from the products of the country or by moving supplies up from the base, if not obtainable in the vicinity, every care being taken from the first of animals.

The staff proposed for the organization of the service is,

A Director General of Transports.

A Director of Transport for each line and the base.

A supply and equipment officer at the base.

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Officers for each 1000 animals with a staff of N. C. officers and subordinates.

A Vet: Surgeon for each Division.

A Vet: Surgeon for the infirmary at the base.

A Pay Master with regular Accountants.

Officers in charge of depôts on the line of communications with staff of N. C. officers and weighmen.

Brigade Transport officers to each Brigade, with officers to every 1000 animals in the reserve train of the active line under the Director of transports of the active line.

Regimental officers with a complement of men told off from every company to look after the animals and form part of the guard.

Transport officer in charge of all supplies and repair of gear on the active line, with an adequate staff of gomashtas, purchasing Agents &c., &c.

Transport officer, one to every 1000 animals of the reserve to look after animals on the line of march.

1 Jemadar to	150	mules.
1 Duffadar to	50	,,
1 Muleteer to	3	,,
1 Surwan to	4	camels.
1 Duffadar to	25	,,
1 Naib chowdry and		
1 Moonshe to every	500	,,

As subordinates, there should be a sepoy to every 100 animals, who would be in charge of them, looking after their feeding and care &c. N. C. officers to every 500 animals, to check and count the numbers and help in the general transport.

1 Nalbund and 1 Moochie should be with each regiment, 1 Salutri to each Brigade, and a like proportion for all general transport.

To enable the general commanding to estimate the amount of carrying power for a force of Europeans and Natives, if he has carrying power for 4 maunds per fighting man, he may consider he can move his army with 15 days supplies; 1½ maunds per fighting man is a necessity to move troops alone without provisions.

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VI.

EXTRACTS FROM AN ESSAY

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

BY

LIEUT. D. C. DEAN PITT, R. A.

"EQUAM SERVARE MENTEM."

The writer advocates two kinds of transport service.

I. The Transport Service proper—to convey all stores &c., excepting regimental stores.

II. The regimental or corps transport—which should be sufficient to convey the actual regimental stores, tents and 7 days' rations for the regiment.

The Transport Service proper should, he considers, be entirely distinct from the Commissariat Department, and under control of a "Director of Transport" in direct communication with the the Commander of the Force. The commissariat should provide the stores, and the transport be answerable for their delivery at specified places on fixed dates. To ensure efficiency, however, the officers of the commissariat and transport should work harmoniously.

Of the two systems on which this service can be worked, the "staging" and "convoy," the former is the preferable, as less wearing to the men and animals, and more convenient in every way than the other, but it can only be adopted where the line of communication passes through a friendly country. The whole service is kept more compact and each transport officer is less likely to be separated from his particular division or subdivision of the train. In establishing stages, it is necessary to be sure that there is a sufficiency of water. To keep up a daily stream of 500 camels on this system, it would require 1000 camels at each stage, and if, owing to the length of the march, a day's rest is given at any stage, 1500 camels would be needed at that stage.

When operating in an enemy's country, the transport must be worked by large convoys, accompanying the advance of the troops at first, and afterwards strongly escorted.

Before a campaign is begun, it is necessary to ascertain clearly, what is the best kind of carriage to adopt, what is most easily procura-

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ble, and what prospect there is of being able to obtain suitable grass or fodder on the line. Every point along the line to which grass could be brought from the surrounding country should be stocked, as soon as possible, with the requisite supply.

The carriage employed should be Government property, or contract carriage, but none should be hired, as experience has shewn that in the case of hired carriage, owners neglect their animals and even lose them purposely either to obtain compensation or to enable them to return home.

The merits of the various kinds of carriage are, in the writers opinion, as follows:

Where there are roads, nothing equals *carts*. If camel fodder be easily procurable, *camels* are highly valuable.

For hilly and rocky country and moderate sized packages, *mule* carriage cannot be surpassed.

Ponies are very liable to lose condition and very easily get sore backs and sides.

Bullocks are unsuitable for rough or rocky country, being extremely liable to get foot sore, and requiring to be kept well shod.

The writer remarks that at present there is no service so unattractive as the transport, because not only is the work hard, uninteresting and monotonous, and the pay inadequate, but few officers employed on this duty can expect to ever see the enemy, and the generality feel that, as a rule, their work, however good, is only too likely to pass unrecognized and unrewarded. He considers that the transport department in the field should be recognized in the same way as any other great Department, and share equally the rewards given at the close of the campaign.

The Commissioned Officers of the Department should, he states, be the Director of Transport, Superintendent of Transport and Assistant Superintendent. All orders to Transport Officers should, except in an emergency, go through the Director, who would be in direct and constant communication with the Commander of the Forces and the head of the Commissariat Department. Under the Director there should be a number of Superintendents in the proportion of one to every 2000 animals or 1000 carts.

Each Superintendent should have three Assistant Superintendents, who would be personally responsible to him for the correct supervision of the animals &c. under their charge.

The Staff depends entirely on the size of the transport service, but as a rule, the writer considers, there should be a staff officer as Personal Assistant to the Director, a Pay Master and Quarter Master, with well

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organized and efficient offices. The Pay master would arrange the accounts of the whole service, providing each Superintendent with funds for the payment of his division, and checking the monthly accounts of the Superintendents. The Quarter Master's duties would consist in the receipt and issue of all transport material, carts, harness &c.

Where the operations are on a large scale, there should be more than one Director, each having his compelte staff as above, and the whole of them should be under one officer to be styled Senior Director or Director General of Transport, who should have a "head office" staff, composed of more than one officer of some service and experience.

The Commissioned Officers of the transport service should be assisted by a very large proportion of Non-Commissioned Officers and men, who would help to maintain discipline and order. Each Assistant Superintendent should have two smart active Non-Commissioned Officers and 6 good privates, half the number being if possible of the British service, and possessing some knowledge of the language.

The establishment of officers and men for every 2000 animals and 500 followers in accordance with the foregoing proposals would be:—

1. Superintendent.
3. Assistant Superintendents each with 670 animals and 170 followers.
6. Non-Commissioned Officers each with 335 animals and 85 followers.
18. Privates, each in charge of 112 animals and 28 followers.

From among the the followers a proportion should be appointed Jemadars with a little higher pay, working under the Non-Commissioned Officers and men; and according to the animals and carts employed, there should be a number of shoeing smiths, camel doctors, carpenters and leather workers. Besides the Non-Commissioned Officers and men, the writer considers that it would be well that each Superintendent should have under him some 10 or 12 soldiers employed as policemen, at least half being mounted. They would much aid the officers and men employed in the executive work of the Transport. Although the number of Officers and men proposed seems large, the writer remarks that, from the thorough supervision which would be secured by their employment, an immeuse saving in the loss of animals would be effected, while efficiency would be secured.

The writer adds that the Director of Transport should endeavor, if possible, not to separate the Officers under him from those portions of the train under their charge; and that the different carts in each Superintendent's charge should, where practicable, follow each other consecutively on the line of march.

With regard to the regimental or corps transport, he states that the carriage should be put in charge of an Officer of the corps, with a fair proportion of Non-Commissioned Officers and men, whose sole duty it

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should be to look after and maintain the efficiency of the carriage and who should receive some additional pay, as their work would be hard, and the responsibility considerable. A corps after it has once taken the field should never have its transport changed, unless it becomes unserviceable, or taken out of its charge, except in a great emergency. The pay and rationing of the regimental followers should be entirely under regimental control, and the followers of each regiment should have a distinguishing badge. The animals and carts should also have a mark to indicate the corps to which they belong.

The writer alludes, as a point demanding attention, to the trouble that has been caused in the late Afghan campaign by the engagement of followers on different rates of pay, engendering dissatisfaction when the men came together. He suggests that the followers should be drawn from the country adjacent to that in which the campaign takes place, if they are well disposed, and from friendly districts through which the line of communication may pass; that each man, on engagement, should receive a card with his name, native village, district, date of engagements, and rate of pay written thereon and signed by the Officer who engaged him; that every payment should be entered on the back of the card by the Officer making it and the date up to which the man is paid be shewn; also and that each man should be made to understand that without the card he cannot expect to receive his pay.

Another point of great importance is the size of packages. No parcel should be too heavy and they should be made up for the description of carriage used. The carrying power of the various kinds of transport is given as follows.

		lbs.		lbs.
Camels	from	320	to	450
Mules	„	160	to	250
Ponies	„	150	to	200
Men	„	30	to	50
Carts—1 pair bullocks on fairly level ground	„	800	to	900
Do. do. in hilly country ...	„	500	to	600
Do. 2 pairs bullocks, level ground ...	„	1,100	to	1,400
Do. do. hilly country ...	„	800	to	1,000

In time of peace, the writer suggests, that centres of transport should be maintained, which could be rapidly expanded, and that at these, a certain number of Officers, Non-Commissioned Officers and men should be put through a "transport course"; at these centres should be maintained native establishments of sufficient size to be able to furnish the jamadars, shoeing smiths, leather workers, wheelwrights &c. to a very considerable section of the transport service at the opening of a compaign.

The regimental transport need not be kept up in time of peace. The carriage should be given to the corps directly it is ordered on service, and a staff of jamadars &c. be supplied from the transport centre.

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VII.

EXTRACTS FROM AN ESSAY

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

——:o:——

"Si vis pacem, para bellum"

The equipment of a force should be on the regimental system, with carriage, victualling and hospital establishments.

2. On a regiment joining the Head Quarters of a Division a proportion of its establishment to join the Divisional Commissariat. When a regiment is ordered to move, the establishment to rejoin, the cattle and attendants being then permanently attached to regiment.

3. The above system was tried at Camp Hassan Abdul and Bangalore and reported on most favourably.

4. Gives establishment for the above.

5. By adopting this system there would be a great reduction in Division and Brigade Establishments.

6. Gives carriage required for corps, 1000 strong, including rum and rations for 10 days and carriage for grain for cattle.

	Camel power	Mules or bullocks	Carts.
British Infantry	... 328	or 952 or	150
British Cavalry	... 1066	„ 3134 „	484
Artillery (1000)	... 1090	„ 3170 „	490
Native Infantry	... 185	„ 537 „	81
Native Cavalry	... 895	„ 2619 „	393
for a force of 5000 men	=3,564	or 10,412 or	1,598

Equivalent to the carriage of 637 tons.

7. The transport should be a branch of the Commissariat, the Commandant of Transport having the rank of Deputy Commissary General.

8. The animals to be divided into divisions of 1000 each and subdivided into troops of 200.

9. Half a dozen elephants or so to be sent to the port of debarkation for moving heavy articles.

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10. Desirable that the transport animals should be procured in the country; brings to notice the value of country bred ponies and recommends that a trial be given them.

11. Details the ports in the Red Sea where transport animals are procurable.

12. Carts—plan for retiring the wheels suggested.

13. Port of embarkation and debarkation,—duties at and establishment for—

14. *Accounts*—Recommends simplification of accounts; extra work is caused by examiners; gives extracts from reports by Sir Charles Trevelyan, Sir Garnet Wolseley and Colonel Mignon on the subject.

15. *Pay*—gives rates of—to subordinate establishments in Abyssinia.

16. *Carriage*—revised estimate for a force of 1,000 of each arm, British Infantry, British Cavalry, Royal Artillery, Native Infantry, Native Cavalry, with ration for man and beast for 10 days=3579 camels or 10649 mules or 1605 carts for 640 tons.

Mule Breeding and ponies.

17. Gives suggestions regarding the purchase of ponies, and proposals for establishing a Mule breeding stud.—

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VIII.

EXTRACTS FROM AN ESSAY

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

——:o:——

"JUGURTHA"

In this essay, the writer divides his subject into the twelve following parts :—

I.

Necessity for the establishment of a Transport Department.

He explains that the old system followed in asiatic wars, under which the transport arrangements were entrusted to and satisfactorily conducted by the Commissariat Department, can no longer be carried out, because, formerly, the scenes of operations were generally close to the bases and in fertile provinces, whereas now, a change of circumstances requires the maintenance of large armies in countries which are barren, with bad roads and at great distances from the bases of operation.

An *independent* and well organized Transport Department, therefore, becomes an absolute necessity; and as such a Department cannot be formed at a moment's notice, its maintenance as a premanency is advocated, the details of the system being worked out in times of peace, so that every thing may be ready to meet, without delay, the demands of active service. In the field, the Department should be placed under the immediate control of the Chief Officer Commanding.

II.

Requisites of a Transport Service.

These are

1*st.*—Capability of contraction to a minimum during peace, and expansion, at short notice, to the fullest extent needed. The transport resources of India are said to be abundant and the only requisite, *organization.*

2*nd.*—An easily worked system—the material being capable of repair by unskilled labor, of bearing rough treatment, of working on bad roads and consuming a minimun of transported materials to keep it working. The descriptions of transport to be employed must depend on the peculiarities of the

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countries where operations are to be carried on—thus, boats would be required in Lower Bengal, during the rains; horse waggons in China; elephants in Assam; camels in Arabia; and the Intelligence Department should be required to keep up a thorough knowledge of the transport requirements of all Asiatic Countries.

III.

Regimental transport to be separate from supply transport.

Regimental Transport.

Every regiment should have its own transport for the conveyance of camp equipage &c., so as to be able to march at an hour's notice.

The Bengal Cavalry system of regiment transport is pointed out as an example, and a calculation is worked out shewing that if mules or ponies are employed the cost would be Rs. $4\frac{1}{4}$ a month each, and if camels, then the cost would only be Rs. $3\frac{3}{4}$ a month each.

This transport must be the property of the regiment, the officer commanding being responsible for its efficiency, and deductions being made from the pay of the men for meeting the expenses of its maintenance. A proportioned increase of pay must also be allowed to meet this new demand.

Supply Transport.

Government must keep this up for the purpose of sending up supplies and military stores from the base of operations to an army in the field, its constitution being of an expanding and contracting nature, according to requirements.

IV.

Varieties of transporting means.

BY WATER.

Ocean steamers and ships,
River steamers,
Country boats,
Rafts.

BY LAND.

Railways,
Tramways,
Traction engines,
Horses,
Mules,

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Ponies,
Bullocks,
Camels,
Elephants,
Men.

Steam transport, by sea or land, is the best, and difficulties only commence when this means ceases to be available.

The use of country boats on rivers in the directions of lines of communications is urged on the ground of economy, expedition and facility of acquirement.

ON LAND—*Tramways*, though good might be supplanted by light railways.

Traction Engines require too much preliminary preparation.

The Elephant eats more than he works but he is useful in marshy places.

The horse is a good draught animal but requires plenty of care and good food.

The mule is hardy, capable of great endurance and will work in any country in the world, either as a draught or pack animal, requires only a sufficiency of food and proper gear and loading, and is especially suited for rapid movements across country.

The pony is very similar to the mule, though less enduring.

The bullock is pronounced to be the most useful transport animal, both for draught and pack; and though their progress is slow, it is certain. They carry a fair load and require very little fodder and attendance and are especially suited for forwarding on heavy stores from the base of operations to the front, along roads in fair repair.

For centuries the whole of the grain transport of Central India has been carried on by herds of bullocks, a dozen men or women being enough to manage 200 or 300 cattle.

The buffalo is more sluggish than the bullock and the supply of this animal is limited.

The camel is long suffering and one of the best transport animals in the world, subsisting on coarse and scanty food and only requiring attention during sickness.

The loss of the 60,000 of these animals in the Afghan campaign of 1878-79 is attributed to neglect, ill usage and starvation, and the

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want of the knowledge of the deseases of camels and their treatment. The establishment, therefore, of a Veterinary school for the study of camels and their ailments is recommended.

Camel carriage has been for years employed between Agra and Gwalior.

Coolies are too costly and carry very little to be of any practical use; but they were successfully employed in Acheen by the Dutch.

From the foregoing, therefore, it will be seen that the various transporting agencies stand in the following order.

Bullocks,
Camels,
Mules,
Ponies,
Horses.

The others mentioned are too expensive.

V.

Wheeled Transport

Wheeled transport, as far as practicable, has every advantage over pack transport, as an animal will convey three times as much on wheels as on its back, without incurring the risk of a galled back.

The chief essentials in a good cart, for horse or camel draught, are strength, simplicity, portability and lightness.

A good selection might be made from the varieties in use in England and America.

Some of the bullock carts used in the Kabul war seem to be of good pattern, but their prevailing weakness is their liability to give way in the axle, but his might be remedied by having the outer end of the iron portion of the axle fitted into a strong wooden bar.

Light carts drawn by a pair of bullocks are preferred to heavy and ponderous ones.

For mules and ponies, a light cart, of a triangular shape, is proposed. A sketch and description of it, and of the gear recommended, accompany the essay. This cart will carry 4 maunds over country tracks and as much as 8 maunds on good metalled roads; such might be used for regimental as well as supply Transport.

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VI.

Pack Transport.

All draught animals should be provided with pack saddles to which draught tackle is attached.

With a view to prevent the causes which lead to the breaking down of animals, it is suggested that transport drivers who know their work and take an interest in their animals, should be employed, animals being hired with their owners as drivers.

Pads, stuffed with rice straw, are better than pack saddles, and the use of "Koorjis" (coarse canvas pack bags) of proper size will balance the loads on the two sides of the animal.

Animals should be unloaded once or twice for an hour during a long day's march.

The best kind of pack saddle, for simplicity and an even distribution of the load, is said to be the "Indian pad" modified as described and weighing 40 pounds, but the selection of a standard pattern should be decided by a Committee of experienced officers.

The camel pack saddle used by Government in Afghanistan was very imperfect and far inferior to the "Kootchie" pattern of Afghanistan.

The bullock pack used by the Brinjaries of Central India, although of a primitive description, fulfils the conditions required of a good pack saddle.

VII.

Organization of the Transport Department in time of peace.

To meet this end, the following suggestions are made.

1. The appointment of Director General of Transport to be permanent.

2. There should be a skeleton Department capable of being raised to the requisite strength in time of war.

3. The superior appointments should be open to civil as well as military officers.

4. Staff pay and the prospects of advancement should be held out to volunteers.

5. A linguistic test should be passed by applicants.

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6. A knowledge of the management of horses should be indispensable.

7. A list of qualified candidates should be kept up and vacancies filled according to requirements.

8. Subordinate appointments might be filled by good charactered time expired men and pensioners from the British and Native Army.

9. Every Bengal Cavalry regiment should have at least six Salootries who have been through a course at a veterinary school and half that number should be available for the Transport Department on Service.

10. The localities where good drivers are to be found and their prevailing castes, should be ascertained.

VIII.

Formation of a reserve of transport animals.

With this object, it is proposed

1. That all owners of horses, ponies, mules, bullocks, buffaloes and camels be made to register their animals and place a valuation on them; and that this measure should be carried out through the civil District Authorities and a fine imposed on all those who fail to register their animals.

2. Immature male and female animals to be exempted from registration.

3. The Director General of Transport to always keep himself acquainted with the transport resources of Districts, so as to equalize his demands on occasion arising.

4. Staff officers on the permanent Transport establishment should be appointed to Districts and periodically check the District registers by personally inspecting the animals.

5. Cast horses, instead of being sold at nominal prices, should be employed in the Ordnance Department, postal service and municipalities, so as to be available for the Transport Department when wanted.

IX.

Supply of Transport material.

For this purpose Government workshops should be maintained at suitable localities and should be provided with all necessary appliances.

All articles should be of standard patterns to be decided by competent committees.

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Large supplies of imperishable portions of interchangeable articles should be always kept on hand for meeting emergencies.

Workshops should turn out waggons, carts &c., for sale, when not required to make them for Government, and all Government bullock trains should be required to use military pattern carts, so that they may be utilized for war service, should the occasion arise.

X.

Mobilization of the Transport Department in time of War.

On necessity arising, the Director General should call for the number of transport officers, N. C. officers and men required from their permanent appointments and apportion the numbers of each description of animals wanted from the several districts. The District Magistrates should then arrange for an impartial selection of the specified number of each, and, if possible, the owners should be engaged as drivers, good wages and free rations being offered as inducements to them to come forward.

All the animals approved of should be made over to the Transport Department at a stated time and place, and after the completion of their equipment, they should be conveyed to their destinations.

Bullocks would generally be obtained trained, but camels and ponies would require about 10 days' breaking in.

The workshops should supply the carts and gear as ordered.

On arriving at the base of operations, the transport should be divided into squads under British N. C. officers, and a certain number of squads should constitute a section under an officer.

XI.

Disposition of the Transport Department on service.

The following measures are recommended.

The Chief Transport officer in the field to be directly under the General Officer Commanding the Field Force.

The line of communication from base to front to be divided into stages, each constituting a Transport Section and having an officer in charge, with British and Native Superintendents, military police, salootries, artificers, transport drivers, animals, carts and material according to requirement.

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A section must not be broken up and changed about but the same animals and men must always work together. This is regarded as the keystone to success.

As the Army advances in the field, the several sections should be moved up, a stage at a time, and new sections formed and sent forward from the base to occupy vacated stages.

The length of each stage should be from 6 to 8 miles, according to the state of the road and thus these short distances would not be trying to the animals.

Advanced sections should be reinforced, as required, by doubling up the weaker sections, only sending up details from the base.

The transport drivers should be armed as pioneers, for the purposes of defence as well as for making roads passable.

Transport field accounts should be reduced to the smallest limits possible, so that officers may have more time to devote to their legitimate duties.

To avoid loss, there should always be a proper system of supervision.

XII.

Concluding notes.

The employment of contractors is not considered reliable.

Regiments halted for a time should assist in bringing up their supplies.

Special attention is drawn to the necessity for reducing to the lowest limits the amount of baggage taken on service by regiments. This may be decided on the opinions of medical officers of experience as to what is actually required for the soldier's health and comfort.

The following are the principal suggestions.

I.

Establishment of a permanent, independent and well organized Transport Department.

II.

Separation of regimental transport from supply transport, the latter being maintained by the State.

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III.

Use of country boats on rivers in the directions of lines of communications.

IV.

Establishment of a Veterinary school for the study of camels and their ailments.

V.

Descriptions of carts for bullock, mules and ponies proposed.

VI.

Proposal for securing efficiency in Pack transport.

VII.

Proposals for organizing a Transport Department in the time of peace, capable of expansion when required.

VIII.

Proposals for the formation of a reserve of transport animals.

IX.

Establishment of Government Workshops for the supply of transport material.

X.

Measures necessary for the mobilization of the Department.

XI.

Proposed detail for the disposition of the Department on active service.

XII.

Necessity for reducing the baggage of regiments on service to the lowest limits consistent with the health and comfort of the troops.

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IX.

EXTRACTS FROM AN ESSAY

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

BY

COLONEL H. MOORE

"Ready Aye Ready"

This officer explains that in all the recent campaigns in Asia, from the Persian campaign of 1857-58 to the present Afghan war, the great want felt by the British Army on taking the field, has been the absence of a properly organized system of Transport. He says that, had such a system existed when the Kabul expedition first set out, all the anxiety, inconvenience and heavy mortality experienced during the conduct of the war, would have been, if not wholely avoided, at least, considerably diminished.

Apart from considering the question of transport with reference to the requirements of India proper, where the difficulty has, to a great extent, been met by the gradually extending net-work of railways, the opening of roads and the facility with which local carriage is obtainable in all parts of the country, and at any time, the writer discusses the requirements of an Army destined to operate beyond the Indus, along a base line from Gilgit to Beluchistan, and first speaks of the camel as a transporting agency.

CAMELS.

These have been, for many centuries, the principal means of transport in the Punjab, Sind, Rajpootana, Afghanistan and the countries beyond; but it is questionable whether their habits and structure suit them to the necessities of modern warfare, which demand constant and rapid marching, scanty grazing &c.,

Besides, the health of camels is seriously affected by changes of diet and climate; and in a difficult country and before an enterprising enemy, they are a source of great anxiety to commanders and can only be managed, properly, by regularly trained drivers.

Their nature and ailments are also not known to our Veterinary Department.

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Pack bullocks.

These have, from a remote period, been used as the chief means for carrying on the internal trade of India, but in recent times, railways and wheeled conveyances have, to a great extent, taken their place.

For modern warfare they are unsuited, being slow and unable to go long distances, and break down in bad ground or in countries where water is scarce.

Ponies.

Ponies are strong, hardy, enduring, rapid in movement and easily procurable. They will eat any thing the country produces, are not difficult to manage, and their ailments are similar to those of horses.

Thirty per cent of military carriage should consist of these, and in the field, when not required for transport, they could be used for mounted infantry.

Mules.

This animal is best suited for military transport work, being docile, hardy, active, surefooted and enduring; is little subject to epidemic disease and thrives on all kinds of food.

Measures should be taken to extend its breed in India, and one proposal is to send good imported donkey stallions about the country, with promises to purchase the stock at fair prices.

Organization of a Transport Corps.

The practice of hastily organizing a Transport Department on the outbreak of war is condemned; to meet the demands of modern times and to secure rapid mobilization, the addition of a "Comprehensive Transport Corps" to the army is recommended.

This corps should consist of 10,000 animals, 70 per cent mules and 30 per cent ponies, all thoroughly serviceable, well officered and equipped, and ready for service any where and at any time.

The corps should be divided into ten divisions of 1000 animals each, and each under the command of a field officer.

These divisions to be subdivided into four sections of 250 each, under Subalterns or transport officers, with two European and two Native Non-Commissioned Officers for each section.

Two Jemadars of syces or drivers and 300 syces or drivers to be allotted to the whole division, giving an average of three animals to each man.

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Farriers, salootries, smiths, saddlers and moochies to be also allowed in a proper proportion.

A division would then consist of

Field Officer Commanding	1
Subaltern Officers	4
European and Native Non-Commissioned Officers	8
Farriers	10
Salootries	10
Saddlers	20
Smiths	10
Syces and drivers	300
Jemadars of ditto	3
Bheesties	20

EQUIPMENT.

This being one of the chief desiderata for ensuring efficiency, it is suggested that the opinion of experienced officers, now serviug with transport animals in the field, be taken on the subject.

Proposed distribution of the ten Transport Divisions.

Permanent Head Quarters.

Six for Bengal	...	Kohat Bunnoo D. I. Khan D. G. Khan
Three for Bombay	...	Quetta Pisheen Kandahar
One for Madras at either	...	Bellary, Sekundrabad or Bangalore; wherever most useful.

At these Head Quarters shelter should be erected for the animals, lines for the officers and men, store-rooms, workshops, hospitals &c.

The organization of the Corps, should, moreover, be such that, on occasion arising, the number of animals might be increased; and with this contingency in view, a double set of equipment should always be kept in store; also 10,000 carts of the best description known; the latter to be distributed among the Head Quarters of divisions and kept in reserve.

On an Army taking the field, animals for the carts could be purchased and the carts used on the lines of communication, and the mules of the Transport Corps, with the troops, on lines of march.

The charge of the carts should be entrusted to European and Native N. C. Officers, under the supervision of officers who have had

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Transport training ; all to be under the General Officer Commanding the line of communication.

The 10,000 animals and 10,000 carts proposed would be sufficient for a force of 25,000 or 30,000 men, but if more are wanted, they could be purchased or hired and sent to the different Head Quarters for the spare equipment waiting for them.

All animals of the Transport Corps should be trained for draught as well as for carrying loads.

The cost of the scheme proposed will be great, but it may be met by making a reduction in the present strength of the army, which would be more than met by the advantage of having a permanent and efficient Transport Corps, ever ready for any emergency. Besides, in times of peace, the transport could be used by the Civil Departments of Government, and in the event of a famine, if would be particularly useful.

One great essential is the necessity for regulating the quantity and description of camp equipage and the baggage of an army in the field.

The tents, both for Europeans and Natives, at present used, are too cumbersome, and smaller, simpler and more compact ones should be improvised for service across the Indus.

All baggage, ammunition, impliments, cooking apparatus, medical stores &c. &c., should be symmetrical in form and of certain fixed weights. This might be settled by a committee of experienced officers.

Ambulances for the sick and wounded should form part of the Transport corps and the kahars should be strong and well selected men and be drilled and armed.

These men, when not required for their legitimate work, might be employed in making roads, on field works &c.,

The dandies used with the native troops of the Kandahar column are spoken of with disfavor.

At the close of the present campaign advantage might be taken of the large number of animals and amount of materials &c.that will be available, to from the *nucleus* of a Transport Corps. If 10,000 animals are thought too many, the experiment might be tried with 8,000 or 6,000.

The chief proposals are.

I.

The addition of a Transport Corps to the Indian army, to consist of mules and ponies, 30 per cent of the latter and 70 per cent of the former.

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II.

The division of the Corps into Divisions and Sub-divisions.

III.

Encouragement of mule-breeding in India.

IV.

Opinions of experienced officers to be taken on the subject of equipment.

V.

Suggested distribution of the ten Transport divisions and construction of lines &c., at Head Quarters' stations.

VI.

Extra equipment and a number of carts to be kept in reserve.

VII.

Carts to be employed on lines of communication and mules with troops on lines of march.

VIII.

Transport animals to be trained for draught and pack.

IX.

Regulation of the descriptions and quantity of camp equipage and baggage to be allowed in the field.

X.

Ambulances to be included in the Transport Corps.

XI.

The Corps might be organized at the conclusion of the present campaign, from the animals &c. that will be available.

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X.

EXTRACTS FROM AN ESSAY

ON

"A TRANSPORT SERVICE FOR ASIATIC WARFARE"

BY

LIEUT. EDEN BAKER R. A.

"Fier, mais sensible."

A Transport Department, quite distinct from the Commissariat and responsible only to the General Commanding, is said to be the only basis on which that Department can be made efficient for the field as well as for use in peace time.

In peace time the plan recommended is the division of the Military Stations in each Presidency into Transport Circles, with some large station as Head Quarters, all under one head, a Superintendent of Transport, (a Lieut. Colonel) at Army Head Quarters, assisted by one Assistant Superintendent (Major or Captain), 2 European and 6 Native clerks.

The Superintendent to be responsible for all arrangements and for the economical working of the Department.

The Assistant Superintendent is to personally supervise the Head Quarter Office and assist the Superintendent whenever required.

Each circle to be worked by a Transport Officer, (Captain or Lieut.), one European N. C. Officer, 2 Native clerks and 1 Native overseer.

The circle Transport officers, who should be officers capable of keeping accounts and managing a large office, will meet all demands for carriage, will pay the attendants and be generally responsible for the management of the transport in their charge. They will also purchase animals, carts, &c., when required ; money for expenses will be supplied them by the Superintendent of transport.

PAY OF TRANSPORT OFFICERS.

Superintendent of Transport	...	Rs. 750	per mensem,
Assistant ditto	...	„ 500	„ „
Circle Transport Officers	...	„ 300	„ „

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In addition to travelling expenses. All appointments should be tenable for 5 years, with an extension of 2 years if desirable.

On the outbreak of war the Circle Transport Officers, with all the available transport they could collect, would march to the seat of war, buying on the road as much transport as they could, their work at stations being carried on by regimental officers. The Superintendent of Transport, after ascertaining the transport available from the different circles, would make arrangements for the purchase or hire of transport to complete deficiencies.

Regimental officers would also have to be obtained from regiments for transport duty. Only Officers who have been at least a year in the country should be chosen, and if an officer is qualified in every respect, except knowledge of the language, this last should not prevent his selection. Officers should be specially selected for their physical fitness for hard work in any weather, good natural intelligence, patience and tact to withstand all trials to their temper.

Organization for the Field.

A Superintendent and Assistant Superintendent to be appointed to each column with an efficient staff of clerks and overseers.

These officers should never leave the "point d'appui," unless the base of operations is advanced, as the arrangements to be made cannot be supervised if they are marching about after the troops.

The Superintendent of Transport should not be hampered by orders from Head Quarters, but should be made very independent, and should have the power of appointing Transport officers to the various posts in the Department.

A Brigade Transport Officer attached to each Brigade always to remain with Brigade Head Quarters. When troops are detached from the Brigade he will make over sufficient transport to the Officer Commanding the Detachment and will instruct him as regards food, care &c., of the men and animals; also supplying money for the purchase of forage.

Every convoy despatched should go in charge of a convoy transport officer, who should invariably have written orders stating where and to whom he is to make over the stores in his charge. He should also have an invoice of the stores he is taking before he sets out. In getting the convoy ready, a certain number of camels, carts &c., should be made over to the Transport Officer the day before he is to start, and the stores that he is to take should be counted over on the ground after he has received his invoice. He would then pack the stores and march at his own time next day, being quite sure of the number of camels he has and that the stores correspond with his invoice. A convoy Transport officer should be allowed to throw away on the march any thing that becomes bad or useless.

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Convoy Transport officers should not be allowed to hand over transport to troops, stations, &c., without special orders from the Superintendent or except under special circumstances.

As convoys can only be worked as long as the line of communication is short, this system can be greatly improved, as the line lengthens, by the introduction of the stage system, convoys only being worked between the most advanced stage and the troops themselves.

Stage System.

Stages should be limited to 10 miles in length and every 6 stages formed into a district, numbered 1, 2 &c., commencing from that nearest the base of operations.

The following Transport Officers will be required:—

District Transport Officer
Stage „ „
Supernumerary „ „

The District Transport Officer (a Captain) will continually visit the 6 stages in his district and see that they are working well. He will also arrange to purchase transport to fill up casualties, &c. and will check and countersign the accounts of the Stage Transport Officers of his district monthly.

Stage Transport Officers (Lieut.) will see to passing on rapidly to the next stage every thing intended for the front and will arrange for the forage of their animals, repair of gear, treatment of sick men and animals, &c.,&c.,

One Supernumerary Transport Officer (Lieut.) will assist each District Transport Officer, and a certain number will remain with the Superintendent of Transport.

Those with the District Officers can purchase or hire transport animals, hunt for stolen animals, arrange for contracts of forage, &c.,

Those with the Superintendent will make themselves generally useful and always be ready to start to take up any work required of them.

General Remarks.

Transport Officers. The writer contends that Transport Officers should be recognized as combatant officers on the following grounds.

A Transport officer comes from the fighting portion of the army to which he reverts when no longer required; is as well acquainted with the art of war as his brother officers doing regimental duty; is invariably supplied on service with an armed escort, and is always more or less liable to attack when on convoy duty or foraging.

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Instruction to Transport Officers. Some compilation of orders, published by authority, on all transport matters should, it is strongly recommended, be supplied to all Transport Officers, as its want is greatly felt, especially by those who join the Department on service without previous knowledge of the subject.

Medicine boxes. Small portable ones should be supplied to all Transport Officers on service, with simple instructions regarding their contents. They should also be empowered to draw from the commissariat department rum or other spirits for the use of those under them, when necessary.

Clerks and Overseers. There should always be a sufficiency of this class of men with Transport Officers. Every Transport Officer should have at least one European writer and one Native overseer.

Escorts. Cavalry and Infantry should always compose the escorts of Transport Officers, more of the former being allowed to Officers who have to forage daily after each march.

Working Animals. Branding is recommended on the near hind quarter or neck thus.

5. 2. meaning No. 5 stage, No. 2 Dist.
C. „ Convoy.
2 B „ 2nd Brigade.
6 „ No. 6 Circle.

Carts. Where roads are suitable carts are invaluable. The Maltese cart is mentioned as the best description of wheeled transport for rough ground, being easy to load and unload, capable of a good deal of knocking about, easy to make and inexpensive.

Camels. For transport purposes in Northern India, the Hill, Punjab and Sind camels would be chiefly used.

Hill camels are said to be very strong and hardy, working well anywhere and doing more work than half a dozen other kinds of camels put together, with a minimum amount of care and indifferent forage. They cost double and often three times what other camels do, but are well worth the price paid for them.

Punjab camels. With good food and management will do a fair amount of work.

Sind camels. Are the most inferior and are useless for service with an advancing column where rough work across hills, rivers &c., and exposure to cold and wet have to be undergone. On fairly good roads and with good forage and care they would be useful.

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Mules. Are first class beasts of burden and far preferable to camels, as they can stand exposure to cold, wet and short rations much better than camels. They will eat the coarsest of grass, in fact anything in the way of herbage, and work very hard.

Ponies. Are fairly good transport animals, but should be used where the stage system is in force, not with an advancing column, as they often require to be attended to and placed on the sick list.

Pack Bullocks. Were, it is believed, only once employed for transport purposes on service and then proved an utter failure.

Distribution of Transport.

The following use of Transport is recommended.

In peace time. Punjab and Sind camels, mules (for pack and draught) and Maltese carts drawn by bullocks.

On Service.—*Brigade Transport*:—Hill and Punjab camels and mules (pack).

Convoy Transport:—Hill, Punjab and Sind (only specially selected ones) camels and mules.

Stage Transport:—Sind camels, ponies and Maltese carts with bullocks.

Itlanamahs.

It is recommended that each surwan should have an Itlanamah and should not be allowed to work more then 6 camels at the most.

If a man has more than 6 camels he should be made to supply a surwan for each batch of 6 camels, and Government should deal with this surwan, not recognizing any other owner.

Instead of printed sheets of paper for Itlanamahs, a small book with leather cover (similar to the soldier's pocket book) is suggested, as answering the purpose better.

Accounts and Returns.

Transport Officers on service should be supplied with all necessaries in the shape of printed forms, ruled account books, &c., to simplify his paper work, and returns should be cut down to a minimum.

It is essential that a Transport Officer, who, both physically and mentally, has continuous real hard work, should have the whole of his paper work made as simple and short as possible for him.

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NOTICE.

ALL CHANGES OF ADDRESS SHOULD BE NOTIFIED TO THE HONORARY SECRETARY, SIMLA.

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The Council give notice that Life Members to the Institution will be admitted on the following terms:—

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As Journals are returned from the Dead Letter Office with effaced addresses, Members who do not receive the numbers in succession are invited to intimate the same to the Secretary.

By order of the Council,

A. D. ANDERSON, CAPT., R.A.,

Honorary Secretary.

SIMLA,
July 1881.

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NOTICE.

MEMBERS of the Institution who have not already done so, are earnestly requested to pay their arrears of donation and subscription.

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Members can pay their subscription to the Alliance Bank of Simla Limited, Simla, if more convenient, and the Bank will grant receipts for any money sent.

The entrance fee is 5 rupees and the annual subscription 5 rupees.

Secretaries of Non-Commissioned Officers' Messes, and of Regimental Libraries and Reading Rooms, can obtain the Journal of the Institution by paying in advance the amount of the annual subscription only.

Members on changing their addresses are particularly requested to notify the change to the Secretary, in order that delay in forwarding the Journals may be avoided as much as possible.

The address book is corrected up to date from the Army Lists, but mistakes are occasionally unavoidable, unless members themselves promptly notify their change of residence.

Members proceeding to England on leave, who wish the Journal to be forwarded to them while absent from India, should inform the Secretary, and send stamps for the postage.

When a member appears in orders for leave to England, his Journal is not despatched unless he asks for it, and while absent from India his subscription is not payable unless the Journal is supplied.

Members on return from furlough can obtain the numbers of the Journal that have been published during their absence, by paying the subscription for that period, and all members on returning to India should inform the Secretary of the fact.

The Secretary will be happy to send an index to Volumes I, II, III, IV, V, VI, VII, VIII and IX, to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Honorary Secretary.

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ORIGINAL PAPERS.

I.

TACTICS IN THE AFGHAN CAMPAIGN.

3RD, DIVISION N. A. F. F.
BY
LIEUT. M. MARTIN R. E.

The study of tactics in India is generally conducted (longo intervallo) after the European or Prussian model, i. e. it assumes an enemy possessing breech-loading arms, inculcates dispersion, use of cavalry in small bodies, employment of artillery at long ranges, entrenchment, advantage of cover, effect of curved fire, &c., &c.

One camp of exercise (in 1873-74) was mainly devoted to the teaching of the system of infantry rushes in attack on a position held by breech loaders.

In essays, at Kriegspiel, and on the practice ground, all formed bodies are declared out of action almost as soon as they come within range.

It is hardly necessary to say that this was not the practical experience of the Afghan campaign.

Tactics of the enemy.

The enemy (generally speaking a race of Highlanders) vastly preferred the attack and usually first obtained the advantage of superior numbers before risking an engagement.

Possessing the advantage of intimate acquaintance with the country and being able to dispense (for the time) with lines of communication and baggage and commissariat columns, the Afghan tribes were often able to raise large gatherings on chosen ground, which gatherings always possessed the choice of the initiative. They could always attack us; we were rarely able (except when they chose) to find them at home.

Thus the enemy may be said to have usually dictated to us what form our tactics should take, and a description of their methods of attack should precede that of our own reply.

Regular Afghan army.

At the commencement of the war in 1878 the Amir's regular army was in existence and took up chosen strong positions at Ali Musjid and the Peiwar Kotal. The first strong by nature and art, the last chiefly naturally so.

The superiority of our artillery rendered both these positions untenable, and it does not appear that the regular troops of Afghanistan are nearly so formidable as the tribal gatherings.

The little discipline enforced is quite insufficient, and there is no confidence in their officers which compares with the devotion the peasants can, at times, display towards their chiefs.

The presence of a tactically immovable artillery hinders the action of an asiatic army, which finds itself tied to its guns; and though the

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loud reports of the quaint ordnance give a certain amount of confidence, a purely passive defence can rarely be very formidable.

The mounted men, including the officers, are the first to display their superior intelligence by appreciating the hopelessness of the struggle and leave hastily. The rank and file follow, and the regular army of Afghanistan (except at Herat and perhaps in the far north) ceases to exist, destroyed more by the faithlessness of its leaders than by English efforts.

The cavalry action of Tukht-i-Phul, on the Quetta-Candahar road, was in reality only a flight and pursuit; no inferences can be drawn from this brush, unless to notice the deadliness of the thrust and the comparative harmlessness of the sword-cut on a thick poshteen or sheepskin.

Tribal efforts.

The action at Khushki-na-Khud was the first of the tribal actions fought on the southern side. The enemy were dispersed by a charge.

Ahmed-Kheyl.

The action at Ahmed-Kheyl, on the Candahar-Ghuzni road, may, however, be taken as an example of the best form of tribal resistance, as a considerable amount of skill and forethought were shown.

According to their own accounts they selected an occasion when our division was 100 miles from any support (from Cabul and Khelat-i-Ghilzai).

They assembled a force, said to outnumber ours by 10 to 1, largely composed of fanatics, and they chose their position.

This was on the left flank and parallel to our line of advance on Ghuzni.

The greater number of the enemy were concealed behind the hills on our left, and only a certain number paraded in three lines on the crest and slope towards us. The bottom or foot of this slope ended in rolling ground and nullahs which afforded plenty of cover from fire and opportunity for formation, and placed our guns and rifles, as well as our cavalry, at a great disadvantage.

Our force formed a rough line to the left, and it was probably their intention to draw the infantry three-fourths of the way up the slope and then attack them when blown, surround them and cut them up. In this they would probably have succeeded had not the accurate fire of our 12 field guns rendered it impossible for them to do anything but advance or retreat.

General advance.

They chose the attack and, after rallying to the crest, poured down on our front in a continuous swarm, firing very little but advancing in the most determined manner, each standard leading its appointed following. It was then that their numbers began to be seen and appreciated, for a very large number of the less courageous blenched from the front of our fire and swarmed across our right and our rear on to the plain, while a still larger number appeared on our left on the hill tops and sides and threatened the baggage. We were clearly surrounded and outmanœuvred, and it was evident, that should the determined front attack

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succeed, the whole of the great army of expectants would cease to watch events and hasten to participate in victory. It was during the general advance that the enemy's cavalry attacked our single regiment on the left. Collecting at the foot of the slope, in the nullahs and depressions, they were able to cross our front uninjured by fire and fall on our Lancers on most unfavourable ground. The enemy were in no formation, and exposed (but for the ground) a most easy spun-out flank for fire and charge, but the Lancers had not the time nor the ground for a counter charge at speed, and though the *shock* of the little horses and ponies must have been insignificant, the enemy were soon among our men. By 10's, by 20's, by 6's, &c. they broke among the Lancers and the fight was already a mêlée when a nullah to the left poured out a similar contingent of horsemen.

Cavalry attack.

The Lancers were broken and retired through the infantry to reform, the enemy's horsemen being driven back by infantry fire.

The enemy's main infantry attack on our front and centre succeeded in pushing back our infantry. The artillery were obliged to conform, but a new line was formed 300 yards to the rear, and the attack had really begun to slacken before the retirement.

Front attack.

The enemy, encouraged by our retreat, again advanced, *but after a check*, and it was evident that their force was spent; a renewed fire broke the front attack finally and all danger was over.

I have mentioned the threatening mass that swarmed past our right on to the plain. This was charged by the 2nd P. C. without supports of any kind. Our cavalry penetrated a certain distance only, were overlapped and nearly enveloped, retired and reformed.

Right attack.

The mass still hung indecisively. When, however, the front attack was broken, the horse artillery* (Rt. ½ battery) swung round 3 guns and fired to their right rear on this mass. It broke almost immediately, and the 1st P. C. coming up joined with the 2nd P. C. in a very short pursuit.

The gathering on our left and left rear was disposed of by 4 rounds from the 40 Pounders. (6/11 R. A.) which effectually sought them out at 3000 yards, safe among the hills, as they thought.

Left feint.

With regard to the inferences to be drawn from this action it appears—

1.—That Afghan numbers are most difficult to estimate, but that, when standards are displayed and battle offered, they must be estimated at about four times our own force at the least.

Summary of enemy's tactics. Ahmed Kheyl.

2.—That the most formidable attacks are those made by tribes that have not before tasted artillery and breechloading fire. (This is also the Russian experience, vide Genl. Zeddeler). In this case the

* G/4, the Field artillery battery, was, at this time, also playing on the right and left attack, working by divisions. Being on lower ground G/4 was not so conspicuous as A/B R. H. A. though fully as actively employed.

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Tarrakis, Andaris, Suliman Kheyls, &c. were undergoing their baptism and met it unflinchingly, sometimes with only a stick as a weapon.

3.—That a broad distinction may often be drawn between the fanatic Ghazis who head the attack and the great mass who are doubtful. Many Afghans left the field at the first good shell before the advance.

4.—That determined rushes of swordsmen are not usually made by well-armed riflemen or jezailchjes, and that, when such occur, the fire will be generally contemptible.

5.—It follows from 2, and from the self-sought destruction of the greater part of the courageous Ghazis mentioned in 3, that a second equally furious attack, after the first has been well met and punished, is not to be expected, and has, in the same district, become almost impossible.

6.—It also appears that, like bears, the Afghans prefer charging *down hill* and will not readily even pass a hill the summit of which is occupied.

Our own tactics will be noticed further on.

Night attacks.

Another kind of attack, and one favoured by only certain tribes, the Alizais, Waziris, &c., is the night attack.

This is most formidable, neutralizing as it does, to a great extent, the value of our infantry and artillery fire, and paralyzing the cavalry. Hand to hand the Afghan is probably our equal, man to man, though in reality an inferior swords-man, but he has the advantage of us in intense personal and religious hatred of us, and, when a Ghazi, is doubtless extremely indifferent to life.

The best protection against night attacks is good information and counter day attacks. A night attack is said to have been planned against General Hughes, Ghazis told off to rush each gun, &c. He frustrated this scheme by himself attacking the enemy at Charjui. A level plain is the best protection for a camp against any attack.

Charjui.

Our own tactics.

Infantry.

In a serious engagement with determined swordsmen, and under no crushing fire, it does not appear that the fighting line is best disposed in skirmishing order. On the contrary such lines are out of hand and unsteady. Companies become mixed and all control is sometimes lost.

Line of companies, with supports on both flanks, is probably the best battalion disposition. If necessary, files should be slightly loosened to admit of easy firing. The bayonets and rifle barrels of the front rank were sometimes struck and jammed by the bullets from the rear rank. In engagements such as Ahmed Kheyl, bayonets should be fixed. There was probably a moment when an advance with a cheer would have been the right manœuvre, but it was not so taken advantage of at Ahmed Kheyl.

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Cavalry (especially lancers) should never be halted on ground where they cannot charge at speed, nor are any great results to be expected from charges made without supports. Not only were no horse artillery or infantry combined with the cavalry at Ahmed Kheyl, but the two regiments, at first present, acted independently and without anything like their just effect.

Cavalry.

Ahmed Kheyl.

On the 1st July, three Regiments left General Hill's camp at Zergunshahr at 3 A. M. and, catching the enemy unprepared, engaged in a running fight for some 8 miles. In this case the force was sufficient, the enemy were never allowed to form, and 200 of them were killed, the gathering being wholly dispersed. Here horse artillery would have been only a hindrance, the ground being here, as in most places, too difficult.

Pad Khao.

The artillery bore the brunt of the action at Ahmed Kheyl and its fire broke the attack. All the case was fired, and it does not appear as if 4 rounds per gun is enough where the direct defence falls mainly on this arm. The shrapnel reversed had not the same effect as case.

Artillery.

Ahmed Kheyl.

Possibly the first artillery position was too close to the enemy, (1300 yards) but with young infantry it is more then ever necessary to have one or two batteries of the inherently steadier (and older) artillery in the firing line, although not the best artillery position technically. This principle is too generally acknowledged on the continent to need defence and is one of perhaps few that seems equally applicable to Asiatic warfare.

At Urzoo (near Ghuznee) on the 23rd April the action was chiefly an artillery one. The enemy were in orchards and villages, and a very large expenditure of ammunition (double that at Ahmed Kheyl) was required from the artillery. The effect was not good, and it appears that the infantry might have been employed to clear the villages without suffering the large loss speculated on. The heavy battery was not employed.

Urzoo.

There was little engineering during the advance-Candahar-Cabul-except road-making for which the 2 companies Sappers and Miners and their officers, with very occasional infantry help, were sufficient.

Engineers.

No entrenchments were used on the field. Occasionally shelter trenches were constructed, but were not generally approved of and were often absolutely harmful to the piquets.

Any entrenchments afforded to piquets should rather take the form of stockades or high mud walls *which cannot be rushed,* than of little mounds 18 inches high which can. No villages were put in a state of defence.

Baggage may not at first sight seem to have much connection with tactics, but it had an important influence on Ahmed Kheyl. Out of a force of 7,000 men, only 1,300 bayonets of the 2nd infantry brigade, with the infantry of

Baggage.

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General Pallissers brigade (500), and 1 company 60th escort, were brought into action. The whole of the 1st brigade and a very large proportion of the 2nd and cavalry brigades were guarding the baggage. The 1st brigade (rear guard) was 4 miles from the advance when the action commenced. Nor did this seem necessary.

An open plain lay to our right, between the Ghuznee road and the Ghuznee river, away from the enemy. We had over three hours notice of his wishing to engage. On this plain it would have been easy to pack the baggage in square under charge of, say, the 25th N. I. and one squadron 1st P. C. releasing the 15th Sikhs, 60th Rifles and 1st P. C. with the mountain battery 11-11 R. A. for active operations. All baggage guards might then have joined their corps (the cavalry especially) and though some inconvenience might have resulted, it was better than the risk of attacking with an insufficient force.

More in fact might have been done to *ensure* the success of the action before the safety of the baggage. The greater contained the less.

Subsequently, the heavy battery with its mile of baggage, the nearly-useless engineer park, and cumbrous ordnance field park, were disposed of and the treasure reduced.

This greatly increased the fighting strength of the 3rd division N. A. F. F. for active operations, but the formation of the baggage in thick columns on several lines rather than in one string on one line, should always be adopted whenever the country allows.

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II.

NOTES ON THE OPERATIONS IN THE KURRUM VALLEY 1878-79.

By
LIEUT. M. MARTIN R. E.

In wars, such as the one we have lately been engaged in, we find ourselves in face of few of the problems which take their form from the incidents and surroundings of the great European struggles.

The objective points are less closely defined; the advantages to be attained by reaching and occupying these points are difficult to measure; the resistance to be met is uncertain in quantity and character; the latest European tactics have perhaps to be abandoned for those of Cæsar; and the difficulties of the country, while precluding the striking movements which, from our study in the campaigns of /59, of /66, of /70 and of /77, undoubtedly throw an increased strain on the Commissariat, Transport, Quarter Master General's and other departments.

It is generally believed that the Algerian campaigns, necessitating a loose system of warfare and being for many years the only active experiences of the French army, formed for that army a bad model, and were the means of engrafting faults of system and discipline which were conspicuous in causing disasters in 1870-71; and our own disasters in Zululand may be largely attributed to over confidence in an excellent arm (forgetting that its value in the hands of recruits is vastly diminished*) and to the contempt of an enemy whose in and in tactics has thrown us back on the entrenched camps of the Roman conquest.

For these reasons it seems unlikely that many hints can be gained from our late experience which would be useful to us in any European struggle, and further, that our late practice should be conscientiously studied lest we may haplessly engraft the faults of self confidence into a system which is very far from perfection.

It is then hardly in the political, strategical or tactical aspects that much practical information can be added to our knowledge, but rather in the perfection of the organisation, equipment and use of the several combatant arms and subsidiary departments; and these I propose to criticise in the position of a spectator subject to correction from many better informed and more observant than myself.

Firstly. Cavalry.

Cavalry.

The cavalry which came under my observation was chiefly native, with but a small proportion of British (one squadron). It was formed into a brigade with

* As an instance, see a late Volunteer Snider Victory over a Regular Regimental Martini team.

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one battery of horse artillery attached, but never independently employed, the opportunity which it was hoped the Logar Valley would afford, having never presented itself.

British. The British squadron was magnificently equipped and fairly mounted, but for hill warfare there is no doubt that cavalry pioneers would have been extremely useful; that the horse biscuit would have increased its possible mobility, and that a carefully organised mule service (troop) for entrenchment tools, ammunition, medicine &c. is an absolute necessity. Regimental transport, carefully subdivided to squadrons and troops, has indubitably proved its superiority to hap-hazard methods, and must be modified according to the nature of the service and country in which the troops are employed. I hope to notice this further on, but undoubtedly a mule equipment for first necessities is of primary importance to cavalry in the hills, and although to a certain extent employed and appreciated, much remains to be worked out. The new Martini Henry Carbines proved excellent cavalry weapons and the men understood and used them well. Khaki head-dresses and coats were employed with the squadron of the 10th Hussars and the spike discarded. Undoubtedly this was a good move, and the leather scabbard became a necessity as soon as the swords were sharpened. No alterations in shoeing were resorted to, and it never became necessary to rough. Had it been, there was, I believe, no arrangement so simple and effective as that employed by Veterinary Surg. G. Fleming of the 2nd Life Guards which has never made its way to this country but may still be needed.* There was little noticeable in the employment and action of the 10th except the increased ease with which, owing to practice, files were dismounted and an effective fire from *terra firma* employed.

Native. The native cavalry with the Kurrum force consisted of one lancer and two ordinary regiments. All were similarly equipped, and all were, I believe, comparatively new to the use of the breech loading Snider carbine which had been recently issued. Dismounted drill is discouraged by some authorities on native cavalry who affirm that riding school and drill, if pushed to the same extent as is usual with European troops, will ruin the value and élan of the native trooper, essentially a horseman pure and simple.

How this may be I am unable to say, but the system is well worth discussion.

Some native regiments appeared wholly in khaki, and some discarded the boot for the "patti" or bandage and the spurless native shoe. Whether this last custom is good or not must be a question. An undoubtedly useful introduction by the native cavalry was the buck-shot cartridge for night sentries.

Immunity from annoyance was only secured by occasionally bagging the marauder, and night firing is not too accurate at any time.

The same remarks about pioneers' equipment and ammunition apply to the native cavalry, and I noticed a desire on the part of two regiments

* The great disasters of the *grande armeé* in its retreat from Moscow may be largely attributed to a want of a simple system of roughing such as Mr. Fleming's.

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to exchange their grass-cutters' ponies for mules whenever the opportunity offered. The advocates for ponies have doubtless a good case, but this certainly was a proof of the pudding in the eating for the mule side of the controversy.

As a rule the native cavalry horses are too old, and though the stamp of horse has improved of late years, owing partially to the wish for effect which camps of exercise have given birth to, there is doubtless much still to be done, and our stud system has need of every attention and encouragement.

Artillery.

To horse artillery, in its legitimate rôle as the companion or integer of the cavalry brigade or division, no good luck fell in this campaign on the Kurrum side. Since the Jowakie expedition it seems to have become legitimate to mount the guns and ammunition on elephants and manœuvre as a gigantic kind of mountain artillery.

It is evident, I think, that in the face of active infantry skirmishers, such artillery could hardly move over a mountainous country, and that crowning the heights and searching the hollows on the flanks of such a battery on the march would, in the crumpled regions we speak of, be a most tedious operation for the infantry escort.

So tedious indeed did it prove that, as a fact, very few flankers were ever employed, and the success of elephant artillery in this valley (the Kurrum) can only be interpreted by supposing the direct interposition of providence or by attributing the grossest stupidity to our feeble enemy.

Neither of these suppositions are safe data to found principles on, and this seems to me one of the successful phenomena of the Afghan war which should be deprecated as an example for the future.

Field artillery.

The field artillery present few points to remark on. It was found necessary on two occasions to transfer the ammunition boxes from the waggons (bullock) of the second line to the backs of elephants. This, however, was chiefly due to the steepness of the hills and can only indirectly be held as a point in favour of assimilating field artillery more closely to horse.

Mountain artillery.

But it was to the mountain artillery that one chiefly looked for general adaptability and usefulness; and any expectations formed on this head must have been fully realised. The batteries with the Kurrum force were both native, and in the matter of attention to the mule, lading and unlading, packing up so as to economise space on the march, lightness of equipment, &c., &c., the native batteries would appear to be better practised than the European or British, who are only temporarily organised out of garrison batteries, and to whom the mule must remain a less well known beast.

Gatlings.

Ultimately a very serviceable little gatling battery was packed on ponies and driven by Highlanders of the 92nd Gordon Regiment. The gatlings were never employed and arrived in a partially incomplete condition, but eventually demonstrated their undoubted power. Apart from fortifications, it

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appears to be still an open question what should be the use of gatlings in the open field.

Some French authorities consider that they form the only true escort to artillery to whose pace they assimilate, being horse, field or mountain gatlings according as they are carried or drawn. Cavalry or infantry skirmishers and scouts seem indispensable for the flanks of batteries in action; but there is no doubt that in practice the infantry are often left behind in a rapid advance; and here again field artillery is at a manifest disadvantage, for while horse artillery need never lose its cavalry escort, field artillery has much ado to carry its own detachments quickly into action and no room to spare for the few infantry skirmishers who are so sorely needed.

Infantry. There is very little to be noted with regard to the infantry, which is the least sensitive of the three arms, and adapts itself most easily to varying conditions of service.

The regimental ammunition (mule) service was very well carried out in some of the native frontier regiments, nor am I aware that any difficulty arose from the use of two cartridges (Martini and Snider) for the different rifles of the force. In one case I heard a whisper of a regimental reserve of ammunition being found to be blank cartridge, but this must be a heavy joke. Intrenching tools were supplied to the infantry in liberal proportions and, though little used in the field, proved invaluable in camp and in the hands of the working parties on the roads.

The intrenching tools were chiefly carried on camels, hardly such hardy beasts over rough ground or under fire as mules would be.

The British infantry were not generally provided with putties as were the native troops. For trousered men in cold or wet weather, these bandages would seem the very best leg covering.

Engineers. The engineer troops represented in this force were 1 company (hill or mule equipped) of Sappers and Miners, with non combatant artificer establishment, and 1 regiment (the 23rd P. N. I.) of infantry pioneers who carried a large proportion of their tools on their backs.

It was a small force for the work to be done and was supplemented by the labour of the infantry regiments and by working parties of Turis or other indigenes drawn from the districts occupied, and latterly (but tardily) by Punjabis and Khataks imported from below; the last, I believe, being patriotically despatched by their own Khan or chief during harvest time at the special request of the Viceroy. It will thus be seen that the Engineer arrangements were, as is usual and perhaps unavoidable, rather scratch.

A certain number of officers from the Public Works Department were detailed as chief, field and assistant field engineers, and the communications behind the line of frontier were carried on (by kind permission of the Punjab Government) by Public Works Officers of the Punjab provincial establishment.

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A great scurry took place for tools at the commencement of the campaign and the arsenals (under pure artillery management) were found deficient in many engineering necessities, such as steam rollers, steam stone breakers, fascine chokers, dynamite, gun cotton, &c., &c. This compares very unfavourably with the equipment of the Ashanti expeditionary force, and would lead one to imagine that an engineer officer should be detailed occasionally to overlook the engineer equipment stored in the arsenals (and correctly so) under the superintendence of the Ordnance.

Nothing but a dry season could have enabled the communications to be kept open during the winter, and one can only say that the engineer arrangements were inadequate and suffered from being under several controls.

The engineer force must be proportioned, not to the force, but to the country and the work to be done, and the exact amount of work to be expected from each unit should be fixed. Beyond road making there was little to call for the services of the engineer.* The Peiwar was entrenched as well as Ali-Kheyl, and hutting was in many instances attempted both by the professional and amateur builder.

The Commissariat. The Commissariat is the hardest department to criticise. The arrangements were, as a rule, excellent and at no time were we threatened with scarcity.

Compressed food and hay, and forage biscuits were too modern apparently to be largely employed, though the mobility of the mounted branches and pack animals may be said to hinge on this step; and some scurvy might have been averted by a more liberal employment of vegetables as a food ration. Lime juice certainly produced little effect as a preventive, otherwise the most captious could hardly object to the commissariat department as such.

Transport. The Commissariat was allowed, not without much heart burning, to sway the transport branch. A good deal of friction was the result and entire independence would possibly have produced better results.

As a whole the transport may have been called efficient, but a very large number of camels (of whom, as the railway spreads, the supply decreases) perished.

Bullock cart trains were not split into handy units, and encumbered each other, the traffic, and the working parties accordingly.

The Camel appears to have remained a comparatively neglected animal, and his diet, treatment in sickness, habits, capability of marching, &c. appear to be only partially understood. It is to be hoped that an inquiry into the supply of this indispensable animal will be instituted, and that, if necessary, stud-farms may be formed in proper districts.

* Note. At a time when no dynamite, gun cotton, or detonating fuzes could be obtained by the engineer department, Kurram Valley Field Force, and when blasting was being done slowly and painfully by jumping holes and using small charges of powder, the use of dynamite was general on the works of the Punjab Northern State Railway within 200 miles, where its use is considered (in warm weather) safer as well as quicker in operation than that of powder.

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I believe the stud of stallion donkeys for rearing mules in the Panjaub, &c., is to be largely recruited from France and Spain.

It would be well if the camel were also considered and the Bactrian variety made available in larger quantities.

It was observed that when camels were attached to regiments as "regimental transport" they fared better than when on general duty. The sepoys and camel-men foregathered, and the beasts and their drivers obtained a larger share of consideration, the officers of the regiment naturally interesting themselves more in them. How far the regimental system can be permanently maintained with due regard to economy it is hard to say. Who shall decide between efficiency and economy? The two can only be reconciled, it is believed, in Prussia, by continually relegating staff officers to regimental duty so that they may never lose the true soldier's spirit when laying down the law at their desks.

The Medical Service.

It would be presumptuous, in the face of returns now preparing in prodigious volume, to make any but the briefest remarks.

Medicine was often deficient and apparently illiberally dealt out to the hospitals.

Taking a specialist view, I would gladly see a few medical officers attached to the Quarter Master General's staff for purely sanitary duty, to be always employed on the roads and encamping grounds superintending the cleansing of the ground, removal and burial of corpses, animal and human, analysing water, &c., &c. The existing medical staff had no time for these duties which were not always thoroughly carried out.*

Political and civil officers.

The old English respect for law and constituted civil authority is often carried to extravagance and notably in India where the Roman maxim "*Inter armes silent leges*" appears to have been clean forgotten. The Politicals were by no means silent and the amount of knowledge they possessed of the intricacies of border statistics and tribal detail was something marvellous.

Did any step appear to the military sense advisable, there was a much better, though less comprehensible *political* reason, why it should not be undertaken. The oracle has spoken and the behest must be obeyed. An enemy in sight, who became afterwards hostile, must not be kept at a distance; through political glasses they appeared as "children of nature," while the country out of sight must not be

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* A decided want was that of a field forge and shoeing smith at the Head Quarters of divisions. All officers not attached to mounted branches had to beg their shoes (iron and labour) from R. A. or cavalry, often going long with unshod horses. The efficiency of divisional staff officers' horses must be regarded as all important and warranting an artificer and mule equipment, besides readier access to veterinary advice. Brigades might employ the divisional forge, and infantry regiments should carry shoes made up, hammers, nails, rasps, &c. In each European infantry regiment it would be easy to have at least one man (a smith if possible) available for shoeing This does not relieve officers from understanding and, if possible, practising this useful accomplishment

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explored, the susceptibilities of the sensitive "Tummizais" and "Footl Kheyl" having to be respected.

That much valuable service was performed by political officers there can be no doubt, but that they caused great exasperation among soldiers cannot be denied, and the example of the war in 1839-40 is apt to cause them to be looked on as a very possible source of danger. The extraordinarily civil bias that even a military civilian may harbour, may be illustrated by an anecdote the truth of which I can vouch for. A subaltern of engineers had been ordered to repair a bridge and demanded a supply of timber from the civil authority on the frontier. As this was not forthcoming he informed the said civil authority that he would take it from the nearest village beginning by demolishing the headman's house. The military civilian then threatened to report the engineer to General Roberts, but the latter explained that he must, and speedily, carry out orders received from General Roberts who was pressing for haste—Civilian, "General Roberts is always in a hurry"—Engineer, "War demands that we should be up to time." Civilian (broken hearted and passing his hand over his forehead) "I live under a military despotism", and he produced the wood. This occurred on the British side of the Kurram where the urgency of military necessity was not less intense than elsewhere, and it would appear to the soldier that the necessities of war should be so far allowed, that military law should be proclaimed for certain districts adjoining the proclaimed hostile area. No injury need be inflicted on the friendly districts guarded by the military advance, while military interests would not suffer by being relegated to civil authority, as they certainly did along the line of communications in rear of Thull, for need of a Quarter Master Generals' authority to regulate camping grounds, road making, transport &c. in a semi-friendly and threatened country.

Fords were, on the Kurrum side, often crossed very carelessly. It hardly seems advisable to stake out fords in such rivers as we meet with in India unless long experience has taught us these fords may not always be depended on. It is always advisable to fix a gauge on which may be read the existing maximum depth to be encountered; it is better to trust to native guides in these matters than to empirical rules. A ford should be marked when troops are crossing by mounted markers standing in the water heads up stream. When this was done, no difficulty was experienced and the temperature of the water was never severely cold.

Camps.

The art of camping and rough fortification was much in requisition and thoroughly well practised and understood. The best defended camp that I noticed was surrounded by bush abattis and flanked by half-moon sungas of boulder stone work which held the sentries.

These last were placed within hearing distance and in mutual sight on all but the very darkest nights.

Posts.

The most approved posts were mud serais, flanked by bastions at the alternate angles and overlooking a yard, or cattle-kraal as our Zulu connections would call

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it. Detailed drawings of these and data as to garrison, &c. might be usefully furnished by engineers, and the best form might also be discussed and fixed on. On an average these posts were established some 10 miles apart, and as the country became settled it was found economical to dispense with convoy guards and send out two guards daily from each fort up and down both returning before night.

Say.—Post No. 2. Sends guard homewards with home going train. At 5 miles it meets out going train escorted by guard from No. 1.

Guards 2 and 1 exchange trains and return each home.

Also No. 2. Sends guard outwards to meet guard from No. 3. Exchanges trains and returns &c. &c.

This is undoubtedly the best system, economical as regards numbers, and harasses the men as little as possible. During the latter part of the operations in the Kurrum Valley and Hariab, the escort duty was entirely taken by the contingent of the Punjab chiefs who also manned all the posts along the road. When one remembers the eagerness of these poor fellows to be actively engaged in front, the readiness with which they accepted the less distinguished duty allotted to them and their cheerful and soldier like bearing (even dying men saluting an officer from their doolies), it is hard to believe that the Queen has ever been served by men with a higher military spirit than the Sikhs of the Punjab contingent who crossed the Indus on Her Majesty's Service.

The Punjab chiefs contingent.

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III.

A SKETCH OF THE EGYPTIAN ARMY.

(TRANSLATED FROM A GERMAN MILITARY PERIODICAL)

BY

CAPTAIN R. ELIAS, 59TH REGIMENT.

The Egyptian army consists of regular troops of all arms, besides irregular cavalry, or Bashibazouks. The Bashibazouks are recruited from all parts of the kingdom, Albania, Candia and Syria furnish the bulk, but many come also from Nubia and its neighbourhood. There is no fixed establishment for the irregular cavalry; it is raised according to the numbers required on any particular emergency. The Bashibazouk is supported by the Government and receives a horse, his uniform, arms and ammunition, bread and 30 francs a month. By stopping a certain regular amount from his pay, the horse gradually becomes his own property. There are 400 Bashibazouks in a regiment (ordie) which is divided into two divisions, each 200 men. Each of these divisions has a commandant and 3 to 4 officers who are appointed by the chief (Sancha) of the regiment. The latter receives his orders direct from the war ministry, and is responsible that it is always ready to march and fight.

The Bashibazouks are quartered by half regiments on the coast of the Red Sea, in Darfour, and on the White and Blue Nile, where they live with their wives and families, who, in some cases, accompany them on their warlike expeditions, greatly augmenting the numbers of the army. In war the special duty of these troops consists in reconnaissance and the service of the advanced guards; in peace they are employed to accompany military expeditions into the interior, and they furnish an escort of 500 men to the caravans which travel yearly on pilgrimage from Cairo to Mecca. The Egyptian government appears lately to have been struck with the difficulty of training these undisciplined and half savage hordes to the requirements of war; this, and probably the expense of their entertainment, will account for their numbers having been limited to seven regiments of 400 men each.

The regular troops are composed of infantry, cavalry, artillery, pioneers and train.

Although there are in Egypt no regular recruiting laws, yet in time of need all natives of 15 years of age and upwards are liable to be enlisted. The duration of service is supposed to be from 15 years old till 22, but this is by no means strictly adhered to. The inhabitants of Cairo and Alexandria are exempt from service. The monetary exemption being fixed at 10,000 piasters (£102-11-3) forms a not inconsiderable source of revenue to the state. As in Egypt to become a

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soldier is accounted a disgrace, the ranks are almost entirely filled with the lowest classes.

Recruiting is carried out according to the requirements of the occasion, and pretty equally distributed over Upper, Middle and Lower Egypt, Nubia and Syria. Governors of provinces fix the numbers to be supplied by particular places, of which the mayors (Bürgermeister) are held responsible that so many men fit for service are forthcoming; hence it frequently happens that the conscripts are despatched to their destination in chains; but, as there are no lists of any kind, the door stands open to any amount of peculation and bribery. Until a few years back only men of sound body were taken for the army, consequently it became the custom to mutilate the children by cutting off a thumb or blinding an eye in order to evade military service; how general this practice must have been may be seen by the fact that nearly every middle aged man of the country population is mutilated in some way or other. The Government, however, put a stop to this by enrolling men notwithstanding these mutilations. The normal time of service is, in the infantry 5 years, cavalry 6, and artillery 7; but in this, like every thing else in Egypt, the greatest irregularity prevails.

The regular army consists of

16 regiments infantry and 2 Negro regiments, of 4 battalions, of 8 companies, of 105 men.	60480 men.
8 regiments cavalry of 5 squadrons, of 2 troops, of 64 horsemen.	5120 „
4 artillery regiments of 3 divisions, (orthas) of which 2 orthas have 4 batteries of 6 guns, and 1 ortha 2 batteries; also	
3 regiments garrison artillery.	

An organization in divisions and brigades exists in so far that there is a division of guards, an infantry division, and a cavalry division, but in peace time this is, like in Turkey, merely nominal, the battalions of the same division being often quartered in places far removed from each other.

Each regiment has 1 Colonel as Commandant (Bey), 1 Lieut. Colonel (Kaimakan) to act as commandant when the Colonel is senior in garrison or camp, 1 Captain as Adjutant, 1 Doctor, several clerks and orderlies.

The staff of a battalion consists of 1 Major (Bimbashi), 1 Adjutant (Lieutenant, not mounted), one ensign bearer (the 1st battalion carries a white flag, the 2nd red, the 3rd blue, the 4th green with half moon and 3 stars), 1 Doctor, several clerks and orderlies.

In a company there are: 1 Captain (Yus-Effondi-Yus), 1 first Lieutenant (Mulazim), 1 second Lieutenant (Mulazimitami), 1 Sergeant Major (Bashi-Tschauch), 1 "Sergeant-Fourier" (Sol-Kol-Agassi), 4 Sergeants (Tschauch), 8 Corporals (On-Bashi), 1 bugler, 87 privates (Nefer).

There is besides in the Egyptian army a pioneer battalion. The train is not regularly organised on a military system. In peace time in

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the large garrisons and camps there are carts for the transport of war material and forage, and they are all drawn by mules.

The equipment of the troops is such that they are ready at any moment to march and fight; with the exception of a portion of the ammunition, the soldier himself carries all the outfit he requires for a campaign. The greater part of the infantry and cavalry is quartered in tent camps, and only a small number of troops in barracks in Cairo and Alexandria. The largest camps are those near Cairo on the "Abassie" and at Torah on the Nile. Around the camps are small huts, made of clay and camels' dung, in which the wives and families of the soldiers live. For all seasons the uniform of the infantry is a short white coat with leaden buttons, wide trousers and linen gaiters over the boots. The red fez with black tassel forms the head-dress. To the further equipment of infantry belong a long blue cloth cloak with hood, white woollen gloves, a large knapsack and cooking apparatus. A second suit of clothes and second pair of boots are carried in the knapsack. It is proposed to supply the infantry with cloth coats, and some have already been served out.

The infantry arm is the Remington, with sword bayonet in steel scabbard. In front each man carries a large pouch with 30 rounds of ammunition, and 70 rounds more are packed in his knapsack. The formation is in two ranks, and the field exercise, written in Turkish, is modelled in all important points on the French plan. Much care is bestowed on musketry practice and the instructors are very efficient.

The cavalry is dressed in short cloth coats of different colors and wide cloth trousers with long boots drawn over them; the fez forms the head-dress, and the trooper's cloak is similar to that of the infantry. His weapon is the sword, and the lancers have a lance in addition. When mounted each man carries two Remington pistols, of which one is furnished with a stock for dismounted service and used as a carbine; the latter is carried when on guard. The cavalry horses are raised in Syria, Arabia, France and Hungary. As they are ridden when only two years old they are small and imperfectly developed. The cavalry drill is modelled on the Prussian, but there is no attempt at regular training of either men or horses. The young remounts are ridden, immediately on joining, with a severe bit and heavy Turkish saddle. From February to May the whole of the Egyptian cavalry is dismounted, and all the horses, except those required for orderlies, turned out in the meadows of upper Egypt. They are shod with iron plates, which effectually protect the hoof from hot sand and sharp stones.

The artillery is dressed in light brown cloth coats with dark brown braid, wide light brown trousers with dark brown stripe, and boots like the cavalry; the head-dress is the fez; both officers and men wear swords. The gun is a 7 centimetre Krupp breech loader, and drawn by four heavy Normandy horses. Driving and riding drill only take place at the small manœuvres held 4 or 5 times yearly in the neighbourhood of Cairo and Alexandria, so that the horses are not accustomed to work together, and the artillery does not shine in

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manœuvring, especially out in the country, where the ground is generally deep and sandy or strong clay.

The pioneers wear the infantry uniform, and are hardly to be considered as a special branch. The men are instructed in building huts and pitching camps, but there is not the least attempt to teach them to construct fortifications of any kind.

The officers are of various nationalities, Natives, Turks, and men who have formerly served in European and other armies. The foreigners represent the talent and intelligence of the army, and off duty do not associate at all with the native officers.

Military institutions exist for the education of officers and non-commissioned officers. In Cairo there is a school for soldiers' children accommodating about 1,000 sons of officers and others. The boys are admitted when 8 years of age. There is also in Cairo, a war school called "Académie de la Guerre Khédiviale;" this is divided into infantry, cavalry, artillery, and engineer departments; here also is the general staff school. In these institutions 400 pupils receive instruction, of whom none are under 18 years of age. There is also a volunteer battalion numbering 800 young men from 16 to 18 years of age, mostly sons of Pashas, Beys and other high officials, and intended for the military service. The nomination of the viceroy is required for enrolment in this battalion; the volunteers wear grey cloth coats with red facings, wide red trousers, and white gaiters over the boots. They are armed as infantry.

In Torah there is an artillery workshop for the repair of guns and carriages; but no gun tubes are made there. There is also an establishment for repairing small arms and another for making powder, both in Upper Egypt.

R. ELIAS, CAPT.
59th Regiment.

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IV.

INFANTRY BATTLE TACTICS.

BY

COLONEL VON SCHLICHTING

Chief of the Staff of the Guard Corps.

TRANSLATED BY

CAPTAIN E. GUNTER, *59th Regiment.*

INTRODUCTION.

It is extremely difficult to speak at present of Infantry tactics in the aggregate, in order to find out the leading principles which should regulate the form of its fighting.

I do not wish to touch upon the art of leading troops. That requires a particular case and an individual leader. The following treatise deals simply with his complicated instrument. It is intended to be a study in the spirit of the Imperial Regulations. I expressly avoid creating a sensation with novel ideas, and shall not lose myself in details.

This much is certain: the conduct of an infantry engagement is more difficult than that of any other arm.

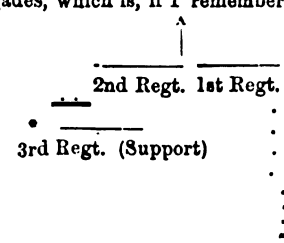
It is daily becoming easier to direct and concentrate the fire of Artillery upon objects the destruction of which may decide the fate of the day. Its conduct is by far more objective. The battery is still the smallest unit which has to be taken into account, as single guns do not come into action independently.

Early deployment, concentrated batteries, or, where this is not possible, an endeavour to obtain concentration of fire upon a common object, has become a fixed law.

Formations, tactical divisions and orders of march, have been reformed in view to this. Scarcely a doubt exists concerning the principles which regulate the employment of Artillery in the field.

The form of Cavalry action in large masses has been lately re-established by the renewal of Trilinear Tactics.* Further from the

* The word "*Dreitreffentaktik*" is difficult to translate, as "*Treffen*" has no exact English equivalent. It is here rendered "*trilinear*" because the author apparently alludes to the formation in three lines now adopted for the attack en masse of a cavalry division of two Brigades, which is, if I remember right, somewhat as follows:—



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great effects of fire action, important and distinct duties fall to the lot of Cavalry. Their importance is recognized, and suitable methods for their execution have been devised, which are simple and feasible. It could refrain entirely from mass-action upon the field of battle itself without losing its importance. Indeed, the increased effect of fire arms restricts such action to quite exceptional instances.

Far more complicated is the case of Infantry on the battle field. It is true that its functions have not changed. They range as heretofore over the whole battle field, where it has either to occupy and hold positions or to wrest them from the enemy. Without a brave, solid, enduring and well trained infantry, victory cannot be hoped for.

If, however, its duties are unchanged, much higher qualifications are now necessary for their correct execution. To begin with, for instance, the character of the enemy's weapon almost entirely forbids close order formations within its range, its efficiency has increased three or four fold. This circumstance compels early extensions. Now it is more difficult for extended infantry to change front, and large bodies are rarely able to make any material change in the direction of their attack.

Hence a battle is more now than formerly the immediate result of the corresponding operations, the lines of which lead mostly without a break direct on to the field of battle. They end where this begins. The heads of the columns of route, therefore, have to commence the action.

It was otherwise formerly. Napoleon had marched on to his ground the evening before Waterloo. His arrangements for the battle were the result of quite independent considerations, having regard to the position and attitude of his adversary, and the nature of the ground and careful examination of the strength and distribution of his own forces. In 1866, on the other hand, the simultaneous deployment of the Prussian army in Bohemia led every where to, so called, "Rencontre" fights on a large scale.

It may be said that the direction of attack is the immediate consequence of the direction of the previous march. This fact, together with that other one, viz., that infantry once extended is scarcely able to change front or direction on a large scale, may be taken into account in order to test the value of those turning movements which at our field manœuvres were so often carried out even on the field of battle.

From the foregoing considerations the following may be assumed regarding Infantry in action:—

1. Infantry fights in extended order.

2. Its early deployment is necessitated. This must be ensured by fighting.

3. After successful deployment its fighting movement is straight forward.

4. Its ground is then in a tactical sense indicated. The old method of fighting did not assume so much. It consisted of the following battle formation, viz. battalions in close columns, or in line, covered by skirmishers. Of these brigades were formed in two or more lines or

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echelons* The brigade brought close to the enemy (when opposed to muzzle loaders only) in column of double companies could, during the long preparatory stage, deliberately choose its front and direction of attack in accordance with the locality, in order to complete with a second or third supporting line the success inaugurated by the first. Now it is different.

Under the fire of the universally adopted improved breech-loader, and with an infinitely superior artillery, it is scarcely possible to bring troops in large masses any where near the enemy.

The year 1866 offers us still some examples of mass manœuvres carried out in the field (Problus), but in 1870, the so called wonders of Mentana were repeated in the selected positions (chosen on account of their defensive strength) of Leipzic and Moscow, the villages of St. Privat, Emanvilliers and Roncourt.

Like waves breaking on a rocky shore, the close columns of the German infantry, shattered by the withering fire, melted away into thousands of scattered drops but to unite again such of these isolated particles as chance threw together in order to renew together their onward rush. Fortunately the enemy's position rendered a united offensive rush impossible. The balance of operative power was on our side, but the inefficiency of our tactical formations had, at a great sacrifice, asserted itself. It was our, God be thanked, victorious infantry, which, at the end of a great war, recognized the necessity of reforming the principles of its fighting tactics.

After both wars literature made itself master of the situation. Some hailed the advent of complete dispersed disorder in which cohesion, organization, even the ordinary divisions of an army, were altogether to vanish. It was contended that this being now the experience of fighting. nothing more was required than to practise disorder. By this alone could the necessary initiative, which ensures victory, be gained. This point of view overlooks the fact that, granted all the bravery and initiative of the troops, it was by superiority in the direction of the operations that our great successes were secured, and that these were often imperilled by the self-will of individuals. The possibility of superiority of numbers not being forthcoming to compensate for tactical inferiority (a case which may easily occur) is quite ignored. For this it would have been necessary to study our few unsuccessful engagements, but it was preferable to dwell upon the fact of our great victories.

In part, however, people busied themselves with deep studies of new formations in order to obviate disorder in battle. Form was to replace form. The Brigade combat became a difficult problem of formations in which entirely extended bodies were first of all to be drawn up parallel to the enemy's front. The first line pushed out a thick swarm of skirmishers, followed in second line (or echelon) by small bodies of

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* In speaking of Infantry formations the word "*Treffen*" will be rendered by line or "*Echelon*," as the word "line" does not always explain it properly, the second "*Treffen*," of a Battalion of 4 Cos. being generally formed thus $\frac{3}{4}$ $\frac{1}{2}$ or similarly in Echelon

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supports, which were shortly to be interpolated with and reinforce them. At the moment of collision the main body followed in line or in column of platoons (zug). Lastly came the reserves in line. In vain. All these attempts made immediately after the war, to invent a patent for passing successive lines of extended troops over the deep zone rained on by the enemy's troops, were found worthless. The local peculiarities of ever changing battle fields would throw such a machinery out of gear. Troops thus extended, but tied down to a certain strict formation, may certainly be moved about on a parade-ground in line with a battalion of direction, but, in battle, prescribed rules for the direction of line are obviously useless, for the places to be attacked would have, in like manner, to be arranged beforehand. In action the circumstances of the fight determine the different local problems that have to be solved. Here a copse, there a farm, has to be attacked; at length the attacking fighting line may actually be on one flank on the defensive.

All such tasks require various leaders, local arrangements, but no fixed uniform formation. Each of these leaders can only conduct his fight by means of those parts of the second line which are at his disposal. Having regard to these facts the normal disposition of these lines with regard to one another—in itself a matter of importance—becomes a secondary matter.

Each locality, which must be utilized, though its character be scarcely known, requires a special disposition. The Infantry, however, whose business it is to carry out the fight, must by careful previous training be able, while carrying out any extension the situation may require, to preserve this special disposition, and at the same time keep within the limits of their authorized subdivisions.

Neither by words of command nor by any one pre-arranged scheme of fighting can unity of direction in battle be secured.

The Infantry element was cramped, the movements of even the smallest group of skirmishers being dictated. Other means are required to maintain tactical order in infantry fighting. The very nature of the fighting has impressed this fact upon every infantryman. Hence the great difficulty in the training of this arm.

In Infantry fighting, therefore, though arrangements can be made for the disposition of the smallest units, these must not be formulated.

The only trustworthy principle for its tactical guidance is to be found in its organization.

The fixed divisions of the troops thus become the data for the solution of the local problems. The Infantry battle consists of a series of combats of the different tactical units. These require, therefore, in the first place closer examination.

During the excitement caused among Infantry tacticians by the events of 1870—an excitement participated in by every military writer—imperial forethought succeeded in indicating, in a few lines, the necessary reforms, without altering the regulations of the service. The imperial cabinet order of the 19th March 1873, which followed the then lately published new edition of the Field Exercise Book, took up the thread with careful hand. It designated the Company-Column as the normal

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formation for battalions in the first line, requires strengthening of the firing line, increased distance between the echelons, and provides against the destructive effects of the enemy's breech-loaders by more extended formations. Para. 8 is, however, the most important. No new scheme is to replace the old one. At the head are placed general rules. General ideas are offered to the leader of the troops for his course of training. Each particular case is treated in accordance with general principles of combat but not according to a regular scheme.

If we now look at the tactical units we shall see what these general principles are.

The Battalion.

The battalion is the smallest tactical unit when we speak of the command of troops, and is at the same time, for our purpose, the most important. To be a good battalion commander is no small matter, for he has to supply in his own person those deficiencies which exist in Infantry tactics. The dispersion of our campany-column combats gives rise to that disorder and dissolution which are a source of serious danger. Company columns are, however, only fighting portions of a battalion, not tactical units. The attempt to raise the half-battalion to the rank of a tactical unit may be said to have failed.

The battalion alone can reduce to system and order the activity of the company-column combats.

Let us see how.

It will be advisable to leave untouched the tactical training of the company itself. To go into that would lead us into a consideration of details unfavorable to a general view of tactics.

We will rather pre-suppose the battalion commander provided with well trained company columns—useful tools, ready to hand.

Military literature created at first a variety of schemes, and the company columns were to group themselves in accordance with one or the other of these as the circumstances of the case required. This did not help the cause much. Each case is original in itself, and requires its own particular formation in accordance with the exigencies of the moment.

The regulations affirm, therefore, that any one systematic method of company column fighting is inadmissable. Indeed any such would have tended only to multiply the "general instructions" to which experts in the art of formations were only too ready to add newly invented words of command.

In the combat of a company column in the fighting line it is a question of disposition of troops, not of formations or words of command.

The division of a battalion into four company columns, each of three platoons (züge) may be said to exhaust the fixed rules as to formations.

The art of leading troops requires, however, as a basis, certain general unchangeable and, therefore, simple axioms in order that its problems may be solved in accordance with systematic harmonious principles.

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These are found in the regulations.

As a general rule the fighting frontage of a battalion in action is the same as when deployed in line.

This is obviously insisted on in para. iii, page 159. Of course the action of a company column requires a certain amount of working room. This is obtained by the 12 platoons of a company column being allowed the same breadth of front as the 8 platoons of the battalion in line.*

At a greater interval than this, as a maximum, a company would be considered as detached, which may, in exceptional cases, be required, but this is never without risk, as a company is no tactical unit for battle purposes. The battalion broken up, as it then is, is still the tactical unit, and to detach a company in action is almost always a mistake. It is only in outpost duty that the organization of a company enables it to act independently.

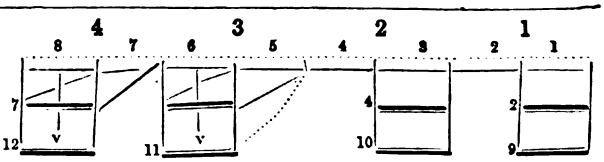
Hence the normal fighting frontage of a battalion is its deployed frontage.

We next come to the disposition of the strength of the battalion on this frontage. Here also we have for guidance a simple general, rule in the regulations. Para 107 demonstrates clearly the great power of infantry frontal fire, and only demands the protection of its flanks to render it unassailable. This view is so important, and indicates so clearly the form infantry should fight in, that para 110 page 155 again brings it to our notice.

In accordance with this, supports in rear of the centre may be dispensed with, and they thus become available to secure the flanks. The principle thus gained (established) is the more important, because, on the one hand, in subsequently moving infantry to support a flank, they generally arrive too late, and, on the other, owing to the range and precision of modern weapons, troops in rear of the centre of the fighting line are more exposed to fire and suffer loss before they themselves come into action. Hence, reserves should be echeloned in rear of the exposed flank.

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* The meaning of this is not obvious from the text: It appears to be this:



The four Companies are in line in close order formed in *three* ranks. On the word "Form Company Columns" the left platoons (züge) of the left half battalion and the right platoons of the right half battalion stand fast in two ranks. The third ranks of the left platoons of the left half battalion and the third ranks of the right platoons of the right half battalion *go about* and retire about 14 paces; the third ranks of the other platoon of their Companies retire and form in front of them making up the Schützen züge. The right platoons of the left half battalion and the left platoons of the right half battalion (two ranks each) retire and form in rear of their left and right standing platoons respectively. About 6 paces is the distance between the platoons. It will be seen that the space thus left is considerable. I have no drill book but I think this is nearly correct.

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Of course the number of companies to be employed in front can only be determined by the circumstances of the fight, but the exposed, because unsupported flank, requires the reserve companies, especially as it is also the manœuvring flank.

It will very seldom happen that a battalion has to fight unsupported on both flanks. But in such a case to attempt to make up for paucity of numbers by excessive extension is a very dangerous expedient.

It will seldom deceive the enemy long, and, should he attain its flank, will render the battalion comparatively defenceless.

A single battalion is, however, more flexible (mobile) than a deep infantry column. Neither encumbered with, nor dependent on, a deep column of route, it can easily manœuvre untrammelled by other corps. But the commander can carry out manœuvring demonstrations only with those companies which he, in the first place, keeps in hand in second line. More can only be effected by companies specially sent round to a flank.

In action the different parts must work together within the normal breadth of front.

A battalion so isolated should, as a rule, have its companies echeloned to the rear on both flanks.* In other words the front should be diminished and the main strength kept back in second line.

As already mentioned it happens but seldom that a battalion has to fight thus isolated, but there is a practical reason why the consideration of the case is important. As remarked in the Introduction, it has happened with a certain regularity, that in our late wars, the engagement was commenced without any pause in the course of the operations, following immediately on the deployment from column of route, say of an army corps or of a division. Now, as the complete deployment of a division† from column of route always takes some hours, the head of the column, that is, in the first place, the leading battalion, is for a long while isolated. Should this battalion, as too often happened, fall upon the enemy with a widely extended front, in hopes of a possible success, the whole fight arising out of this will consist of supporting and reinforcing, by troops hastily interpolated, the fool-hardy leader, to extricate him from his danger, as his forces are soon scattered and overpowered, and to restore the battle which can no longer be conducted according to the original project. We have good cause for serious complaints of this.

According to the rule above laid down a battalion so situated is at first in the position of an isolated body. The principles which should guide it are therefore:—a restricted front with reserves echeloned to the rear on both flanks, a defensive attitude in readiness for immediate action. It should cover the deployment of the deep columns in rear and assist the dispositions of the officer commanding the force.

Only small bodies come at first into contact with the enemy. Woe to them if, by precipitately following up any success, they strive to

* A method somewhat similar to our short echelon with more space between the parts.

† A Division contains 12 battalions besides other troops (Tr.)

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give the engagement a special direction of their own. The result can only be disorganization of all united action. The small bodies and the heads of the columns must conform to the movements of the large bodies following in rear, and, while making suitable dispositions, await the orders of superior authority.

If the above is the proper course for a battalion coming into action alone, it may, on the other hand, be said that a battalion coming up supported on both flanks should deploy on as large a front as possible since it has nothing to fear for its flanks.

Now that we have found an infallible rule for breadth of front and disposition of company columns therein, a word remains to be said touching the depth of a battalion in action.

Infantry, as we have seen, has attained great frontal strength. Supports in rear of the centre or flanks can, therefore, remain at a greater distance off.

This is the more important since the enemy's fire has gained in depth. But if a Battalion is determined to bring things to a crisis it must have everything close at hand. The supports must then be closer and must then be exposed to fire.

Such views of battle shew, however, no cause for "Echelon Formation Tactics." The combat of a battalion can no longer be conducted in accordance with a pre-arranged echelon-scheme. (Treffen-Scheme). That would create fresh subdivisions which would interfere with the integrity of the companies. The battalion commander can, above all, no longer dictate the movements of single platoons, but only direct the companies, each of which has its special functions to carry out, according to the circumstances in its immediate front. One can develop its strongest possible front of fire; another retains one platoon in reserve on the outer flank; while a third is employed entirely in supporting the outward flank of the whole. The echelon system exists. It is important, but an engagement cannot be conducted by it.

Above all the companies must not overstep the limits of the fighting front of the battalion by independent action and thus render every position of the battlefield unsafe. Granted that it is easier to lay this down on paper than to carry it out in the field. In the turmoil of fight, and in difficult ground, a certain amount of disorder and intermingling of the different units will always occur where woods and villages prevent the ground being all overlooked. We will only allude, therefore, to that avoidable disorganization caused by self will. Up to the present the number of these disorganized company fights in our battles has almost coincided with the number of company columns engaged. These are only to be avoided by earnest long continued training and by the severest criticism.

On this subject we have the authority of Scharnhorst, who in the beginning of this century took in hand the difficult task of tactical reform. To him we owe the excellent "Instruction in the Art of Troop leading" which contain tactical maxims as true in our day as in his. He goes so far as to demand that leaders guilty of gross mistakes at manœuvres shall be punished more severely than for other offences

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(see Scharnhorst's Life.) The grossest, because the most frequent, mistake in our day is the disorganization of the combat caused by wilfulness of subordinate leaders.

The battalion must, therefore, be strictly exercised in this school.

The parade-ground has gained in importance. Among the many mistakes made just after the war, was the idea of abolishing the level parade-ground in favor of broken ground.

It overlooked the fact that, on such ground, only those tactics suitable to that particular locality could be practised.

This was condemned by Scharnhorst at the beginning of the century, because in war, dispositions have to be made in unknown ground.

The parade-ground is indispensable if utilized in the spirit of the regulations, that is, for practising all sorts of formations in the abstract, without regard to any particular kind of country.

Still the battalion must always be considered as acting in some defined relative position *e. g.* as at the head, in the centre, or on a flank with reference to other bodies. Then formations applicable to the whole range of offensive and defensive battle tactics can be studied and practised, for the circumstances of the supposed case indicate what these should be.

In skilful hands each excercise will then be part of a tactical course of practical lessons in varied formations, just as the exercises in the field manœuvres which follow are a course of practical lessons in the art of leading troops in the ordinary operations in the field. It would, on the other hand, be quite useless to treat the parade ground simply in its realistic charactor of level plain, in which case our exercises would be, to say the least, very one-sided. Moreover, the parade ground, no matter how level, possesses of all places, characteristics unfavorable to an attack, for an open plain 1000 Metres in depth is the most formidable obstacle an attacking infantry can have to face.

We already know the frontal strength of infantry, and equal armament gives equal strength to an adversary's front.

No refinement of formation, however skilful, no grouping of troops however ingeniously disseminated, can prevent those making a purely frontal attack having to expose themselves in crossing over the open space swept by the enemy's fire.

Even in the hands of the most unpractised of Turks, as long as the sheltered defenders can get ammunition, their fire so devastates the ranks of the assailants, that the bravest hearts lose courage. A frontal attack must, therefore, be preceded and its way prepared by a concentrated cross fire of artillery from the flanks. It will only succeed when the defenders, reduced to the advantage of his strong frontal defence, is shaken and driven back by tactically superior fire from the flanks. Then, from the nature of modern weapons, what seemed at first so strong a position will become to him a very purgatory. Such a situation demands, therefore, a powerful development of artillery fire, a judicious exercise of restraint in forward movements, patiently awaiting the development of the attack, in the course of which the decisive flank movement is carried into execution.

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The parade ground is by no means suitable for the demonstration of the above case.

It belongs, like field manœuvres, to applied tactics.

Marshal Neil at Medola in 1859 has given us a singularly instructive example of the conduct of attack on a level plain.

The Regiment and the Brigade.

Based upon the valuable experiences of the year 1860, the "Regulations for the training of Troops for Field Service and for the conduct of Peace manœuvres" lays particular stress upon the necessity for the preservation of the normal "order of battle" (brigade, divisional, etc, organization). The example therein given of part of an army corps on the march along a road leaves unbroken the unity of regiments and brigades. The principle of advanced guards composed of the Fusilier battalions of different Regiments* is entirely abandoned.

With this, the tactical units composing the brigades, were generally four battalions strong. The cohesion of regiments disappeared, and commanders of regiments were made available for all sorts of extra duties.

The brigade became the battle unit immediately above the battalion.

The disadvantages of this were apparent. The Regiment, that compact corporation, which in peace time most favors "esprit de corps" and uniformity of training, was never kept together and utilized as a fighting unit, and yet the brigade was too unwieldy a body without any intermediate link.

Now it is otherwise.

The brigade commander commands two regiments, but he is now required to avail himself of this organization, assigning to each its own task.

A Brigadier who in the present day would indiscriminately mix up his battalions, just as they happen to come to hand, and send them direct into the fight, would be open to the reproach of being antiquated and would, moreover, deprive himself of his most powerful aids in carrying out his command.

The task a brigade has to execute should, therefore, be divided among its regiments in order of organization.

This may be done by employing one regiment in attack or defence, as the case may be, supported by the others as immediate reserve; or by dividing from the outset the attack or defence between the two regiments.

The latter plan is obviously by far the most practical as each leader supports the action of his troops fighting in front simply by reinforcement with the troops under his immediate control in rear. Hence, in forming a line of battle, a narrow front with good depth is recommended for the different units. The fighting task of each regiment becomes thus more compact and more easily accomplished.

* The Infantry Regiments of the Line have three Battalion the third of which is still called the Fusilier Battalion. (Tr.)

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The first named plan may, however, be necessary when it is required, either in attack on defence, to deploy quickly on a wide front from column of route to secure the further deployment of the whole force.

Even then it is, however, advisable to let the whole of the next regiment (3 battalions) follow or remain halted together at hand in rear of one flank (of course the exposed flank) and not to allow it to deploy as a second line to the first.

No uniform scheme of echelon tactics, therefore, but careful arrangement of the tactical units, assigning a particular objective to each, and keeping them together even when strengthening a flank.

The brigade commander must thus dispose of his troops by regiments and thereby facilitate their leading, this being a more exact method than the echelon system, which alone he formerly could practise.

He is, however, under some circumstances in a better position hereby for influencing the course of the fight, as he always has one or more battalions at his disposal in reserve.

The same principles apply to the regiment and brigade as to battalion. These have been explained above. They are briefly:—deployment on a normal frontage; assignment of objective in attack or defence to each unit; supports on the outer flank.

The normal breadth of front depends upon the number of battalions deployed, the frontage of the latter being fixed.

This principle gives the regiment or the brigade, within the limits which we have prescriled for Infantry in battle, increased manœuvring power (in proportion to the size of the unit) but in a different sense from that which applies to a detached battalion.

For instance: the narrower the fighting front, say of a brigade, the greater can be the interval between the neighbouring ones.

We, in the introduction, pointed out the necessity, according to our experience in the field, of limiting, as a rule, our tactics when once in action to simple forward movements. On the field of battle itself turning movements are, for many reasons, a mistake. The limited speed of Infantry and the wide searching power of rifle fire combine to make the necessary détour of such length as to render the movement generally impracticable.

The danger of a disorganization of the battle would be far more serious here than with smaller units, if a flank movement by one of its component parts renders uncertain the proper fighting front of a brigade. By such a displacement on the battle field itself, troops would arrive in front of other corps, would disturb their action, get intermingled with them, or else lead to a still further dislocation. This style of manœuvring to a flank, once commenced, there is really no end to it, owing to the impossibility of limiting its aims and objects. This attempt at manœuvring to a flank on the first fighting, (therefore extended) line, however, often occurs. When this happens the leaders of the more important commands can never guarantee the preservation of the direction indicated to them.

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Finally, no flank movement effected by the front fighting line can be certain of hitting off the real flank of the enemy or even of securing better ground for its attack. In short this method of attempted outflanking manœuvres has nothing to recommend it.

In considering all these peculiarities of Infantry it is the more important to have the greater part of the brigade which has been kept in hand, ready from the first for prompt deployment in a position sufficiently far advanced to give a new impulse to the fight, whether in offensive or defensive action, by repulsing a hostile counterstroke or by attempting to gain the outward flank of an attacking enemy. The general forward movement will then either strike the enemy's flank or else it is beyond the reach of the brigade, which must then leave the task to one of its neighbours.

But even the most sucessful flank movement has its weak point in its outward exposed flank; consequently this should never be without supports echeloned in rear of it.

As the fire of breech-loaders has enormously increased the strength of the fighting front, the danger of the centre being broken has much decreased.

This changes the form of our tactics and induces the attempts at flank attacks. Yet here the mistake must be guarded against of imagining that the gaining of an outer flank is necessary, at all risks, to ensure victory. Such a desire for outflanking, if unchecked by the necessity of preserving a normal breadth of front, in accordance with the strength at disposal, would render united action impossible and expose the separate fractions to defeat in detail.

Hence, victory may be sought by:—

1. Local superiority of numbers.
2. Gaining the outer flank.
3. Defeating the enemy's fractions in detail.

The tactician can only choose either one of these methods when he has succeeded in preserving the normal front and depth of his own units.

Regard to the support of his inner flank and to the necessary protection of his outer flank will, therefore, from the first deployment materially guide the dispositions of the commander. This necessitates his knowing which is his outward flank. In most cases the reply is simple: the neighbourhood of other corps indicates his inner flank, and similar support on both flanks allows him the widest extension of front. The two regiments of a brigade will, it is presupposed, in this case fight side by side.

Only in rare cases, when not in immediate contiguity to the next fighting body, can any doubt exist. In such instances the general circumstances, the ground, or the objects of the commander will determine it. As long as the leader is undecided on this point his reserve must be kept in hand behind the centre of the fighting front.

This is the true method of determining the "echelon formation" of regiments. As long as this is adhered to, the second line (echelon) must be kept much further back if it is not to participate in the losses

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of the first, and the flanks of the first are consequently less protected. Care must, however, be taken in accordance with para 127 of the Regulations to echelon the regiment in second line (echelon) towards that flank which appears unprotected. The clearer the intentions of the leader are made from the outset the more precise will, of course, the dispositions be.

Herewith the principles which guide the conduct of a brigade in battle may be said to be exhausted. Their application is a matter of practice.

Even in the "formation lessons" the different positions in which a brigade may find itself are endless.

It may be in a position to conduct the fight entirely independently, or be fighting on either flank or in the centre offensively or defensively, and still the principles which may be taken as a guide to a suitable working disposition of its forces will be found to have been indicated above.

It were superfluous to illustrate them here by examples. A still higher degree of interest may, however, be excited by the manifold character which can be given to the supposed cases.

Let us make some effort in this direction.

The brigade is the first to deploy from column of route against an enemy, who is to be attacked.*

Its case is, therefore, in the first place that of an isolated brigade; consequently a defensive attitude, with force well in hand and reserves echeloned in rear of both flanks, is what is required. In the further course of the deployment it forms the extreme flank of the inner wing. But, though the inner flank of the whole deployment, this, as regards the brigade itself, is its *outward* flank for here it is unsupported. Here, therefore, it must have its reserves while it can dispose of its troops of the other wing in the first fighting line.

At the same time all its action must partake of a reserved defensive character, as the decisive blow of the extreme outer wing must be awaited.

Offensive movement is only justified to avoid being driven from its point of appui which is the pivot of the whole manœuvre.

Or again the brigade may form a part or the whole of an outer wing. Here the object is the gaining of the enemy's flank. It finds itself, however, in its turn outflanked, the enemy being engaged in a daring flank movement which, without exceeding the limits of its own tactical front and strength, it cannot outflank. It, therefore, remains on the defensive on the *outer* flank, while determining by a bold offensive counterstroke to separate the hostile flanking body from its main body fighting in front.

The principles of organization of the fight according to tactical divisions, of relative normal breadth of front, and of supporting the

* As for example was the case with the right flank of the I. Army on the 18th August 1870, (Gravelotte).

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flanks, must be always adhered to, and the original object of the fight must always be kept in view.

In giving examples I carefully refrain from entering into details of formations of subdivisions of regiments and battalions.

So many are the formations that obviously present themselves, even when limited as above laid down, that no one case exactly resembles the other.

A commander requires to have his troops in a high degree flexible and well in hand. Here by a quick change of front and rapid deployment a hostile flank attack is to be warded off; there the most intense frontal fire must be brought into play; or again column must be quickly formed after a deployment now become unnecessary, in order to assume the formation suitable to an outer echelon.

In short, even with the aid of simple and concise instructions for formations, much is required of a body of infantry before it can be said to be highly trained.

An intelligent understanding of the leading ideas of the fight is required even of subordinate leaders.

If the exercise is to be of real use, a clear explanation of the supposed case, and the simple but correct execution of the example, according to the dispositions of the commander, is indispensable.

The systematic exercise of mere abstract formation is, on the other hand, of less value, for formations are adopted according to the requirements of the fight, and must be chosen by each subordinate leader for himself and can only be criticised on the spot.

On the other hand the principles of subdivision of command must *be rigidly adhered to.*

The influence of ground upon the leading of Infantry in battle and upon the control and direction of its fire.

Obviously the formal principles of Infantry fighting are subject to modifications according to the ground of the scene of action.

That arm especially, the formation of which is to defend or to seize the localities of a field of battle, must suit itself to its peculiarities and consider its form and situation both in attack and defence if it is to fight skilfully. For this reason the instruction as to formations can only be of a general kind as herein sketched out.

In this general sense, however, the teaching must be upheld.

The ground is not a ruling factor to which the intention of the commander is to be subordinated. The influence of ground is secondary.

The action of the commander must be determined by the general idea of the battle; by the immediate object to be fought for; by his position as regards neighbouring corps; by the prescribed limits of front (beyond which success is unattainable); and lastly by the general disposition of the troops in the first line.

From these factors, the ground in which any one body has to fight, can be determined. It cannot choose its ground with greater freedom but must make the most of what is thus open to it.

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In our lesser manœuvres*, however, the influence of ground is often overrated.

The commander, unfettered by the presence of large neighbouring bodies, seizes upon the most favorable locality and thinks by this practice, which is utterly unlike what would happen in war, to have secured the secret to success.

By such conduct we increase the tendency to a dislocation of the order of battle.

The most superficial glance at military history will show that such cases of unlimited manœuvring room do not occur.

A body of troops operates upon a road, the movement leads to a fight, the deployment follows, the dispositions are made, the objects of the fight are fought for by forward movement, and the ground at hand on the line of advance must be used.

Therefore, formal disposition on fixed principles is the main thing.

With this one can go, so to speak, through thick and thin, can solve the local problems, and is already initiated in the leading principles of the required treatment.

Of course wood fighting is different from village fighting; exercises in localities, therefore, have their own value but must be conducted under detailed instructions. The skilful utilization of ground has become even of increased importance. It can only, however, be a question of that ground within the immediate area occupied by the fighting body concerned. In regard to the peculiarities of the new firearms the ground to be wished for by infantry on the offensive is close ground† as the scene of action. It seldom, however, has any choice.

If a wood exists upon the ground which has become the battle field, the commander, who has to determine the position of the troops in this part of the field, must fight in and around it.

If it is not upon the ground itself, it is not of importance.

The Swief-wald at Königgrätz was no reason for the choice of this field of battle. At the same time it was no hindrance to it.

The principles which guide the disposition of troops have become more independent of these local accidents of ground. Any other idea than this over-estimates the importance of ground.

A well considered plan of operations thinks last of or about the choice of its fields of battle. To do otherwise would be to emulate the faults of the plan of operations of Krismanic.‡

Its aim is simply so to conduct the movements of the armies as to ensure their concentration and reasonable employment on whatever field of battle the operations lead to.

Moreover the power of attraction that "localities" (so called "tactical points" of a battle field) possess is dangerous.

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* Probably the annual autumn exercises of single regiments and brigades are alluded to. (Tr.)

† Such as a wood etc.

‡ The general who planned the Austrian operations of 1866. (Tr.)

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By the conduct of the attacking force they become the main reduits or rallying points of the defence. They are, as a rule, however, by no means so situated that their possession gives the whole command of the neighbouring ground. On the other hand, gaining the key of the position by the whole united offensive often carries with it also the possession of these tactical points.

In regard, therefore, to the utilization of the ground on a field of battle, the concluding remark will suffice viz:—that broken ground admits of closer formations. Here far fewer men in extended order may be employed with strong supports and strong columns in reserve at hand. In open ground, on the other hand, locally, and for a time, defensive action may be necessary.

The general principles of fighting remain, however, unchanged and independent of local questions.

The views opposed to this are fostered by the "lesser manœuvre" in the neighbourhood of the garrisons, where every bush and bramble has its appropriate group of skirmishers and supports foreordained, all cover classified according to its value, and every possible strategical combination on that too well known ground exhausted.

We even neutralize the benefit of the more warlike "great manœuvres" by the "reconnaissances" which precede them and on which they are dependent.

Against these I would quote Scharnhorst's laconic remark "How seldom in war does one find oneself on known ground! A commander who cannot adapt himself to unknown ground and can only adopt right measures when he has exhaustively studied the ground and the manœuvres suited to *it*, will in most cases do little in the field."

The perfected weapon which in the enemy's hand has so materially changed our tactics, has also in our own hands given a different character to Infantry fire.

Those infantry soldiers with whom the bayonet is the favorite weapon and who would rather pursue the repulsed attacks of the enemy on their legs, shouting wild hurrahs, than with leaden bullets, or who, when on the defensive, mask their front of fire by offensive movements, have at length become fewer in number.

Generals of earlier times like Napoleon and Scharnhorst were then already of a different opinion though possessing only the flint lock.

Even Suwarrow's well known saying is to be taken figuratively and only as intended to awaken the spirit of the offensive.

Infantry conquers by superiority of fire.

"The bayonet" is a metaphor for the offensive spirit to be used only in isolated cases.

In any case the offensive of Infantry must no longer be "shock tactics" and must mask no effect of fire.

It is a dangerous peculiarity of the new weapons to shoot far and with a flat trajectory, therefore, deeper spaces up to a man's height above the ground are swept. To ensure our success this circumstance must be rationally utilized, more effectual fire being combined with economy of ammunition.

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The idea of including, under certain circumstances, conspicuous objects at great distances in the zone of a carefully directed fire meets with much opposition. With every respect for the impulse which tends to the preservation of old customs which have won us victories, it must be allowed that, with the new weapon and its performances, a new element has been created which must be taken into consideration. We were superior to our enemy, not because, but in spite of our having an inferior weapon, and were obliged, therefore, to confine ourselves to shooting at short ranges. This restriction can only be a good one when your enemy is compelled to a similar course.

In carrying out the new principle, however, the maxim may be laid to heart that the expenditure of a certain quantity of ammunition is an exhaustion of power that should only be permitted when it will repay itself, that is, when real advantage is gained thereby.

The tactical action is also subject to this modification that, according to recent confirmed experience, a certain quantity of ammunition must be expended by picked shots at the longer ranges in order to secure a corresponding result, as the fire of even the most skilled single marksman is mere waste of ammunition. On the defensive, objects worth the expenditure of ammunition must be brought under mass-fire before they become dangerous to us, and on the offensive, to enable us to carry out our preliminary dispositions for the attack and to divert attention from them.

Unquestionably the defender is more in a position to open fire early He sights his objects sooner and knows the distances. It would be unreasonable were he to allow the approaching enemy to deploy without opposition when he could overwhelm him with a harassing mass-fire.

Mass-fire is, however, equally binding also on the attack.

The assailant is, in the first stage, on the defensive. If he must approach nearer in order to obtain a good view of the objects he has to fire at, and to select the true point of attack, entry into the zone of fire is necessary in self-defence, and especially to bring the decisive points under effective fire. How this is technically carried out—at what distances fire is to be commenced etc, we are not concerned with. It is not our intention to recapitulate here the musketry instruction book. But it is certain that effective mass-fire can only be obtained by continual practice, and that then and then only it will yield results worthy of consideration. This discipline requires emphatically the most thorough training of commanders, subordinate leaders and men.

The direction of the firing on the defensive may be dealt with in few words. The principles are simple enough. Mass-fire is only to be used against a few conspicuous objects, to prevent or impede the deployment of the enemy.

The size of the objects, knowledge of the points most open to attack, and especially of the enemy's intentions, will here regulate the direction. Only by a thorough knowledge of his own weapon can the defender prevent waste of ammunition. This must, however, be all the more carefully guarded against because the direction of the mass-fire to be

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eventually brought into play must remain in the hands of the better informed and more discerning higher commanders. Increased importance must be given to this higher technical knowledge; without it infantry can, no more than artillery, be successfully employed. Infantry fire is still employed occasionally at objects and distances and in methods which show ignorance of the real power of the weapon.

If the attack reaches the zone of individual firing, the fire combat then becomes general. Its principles are not new and require no further exposition here.

In the attack the assailant must, in the first place, strive to gain a position opposite the defender. Only by making use of mass-fire from such a position can the progress of the attack be furthered.

Other troops (battalions or parts of battalions) seize near rallying points, and so on, until on this side only the range of precision is reached and the fire combat becomes general.

The echelons in support come up and extend the range of the fight, increasing the effective, and eventually, flanking fire of the attack.

If by this time annihilating preponderance of fire is obtained, the position is assaulted and taken. The attack with the bayonet is the last act of the drama in which effectual fire has played the leading part.

This, the attacker's fire, must also be "position fire." While in movement no firing must on any account be permitted. It is waste of ammunition. Firing and movement are incompatible one with the other.

The conduct of the fight by formal echelon formation is not suited to these peculiarities.

On the contrary the attacker will have to take care not to expose all at once to the hostile fire the whole apparatus of a broad front of fighting line, supports, etc, simultaneously deployed. The spaces occupied by it are much too wide and the expenditure of ammunition enormous. The losses will also be tremenduous and while in motion these cannot even be repaid. Frequent forward rushes cannot alter this much, for to all intents and purposes it is firing while in motion. To tactical units, that is, to battalions, the task of gaining offensive forward positions as described above will fall, of effectually working from these, and so furthering the attack.

The "occupation" of such positions by, for example, a Regiment ordered to attack, depends on the ground and the amount of cover available.

If the ground affords cover for one battalion only, one battalion is better than two. It is not the number of troops that can be assembled that is important, but the number of bullets that they can pour in; the effect of 10,000 bullets not being changed in the least, be they fired by one or by more tactical units. What one expends is economized by the other, and the flanks of such a position are protected from attack by the general disposition of the troops while its frontal strength is great.

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Whether the foremost portion of the attacking force shall commence the introductory fight for the position or delegate this to the flanking portion, is decided by the circumstances of the case.

Thus, as regards fire-discipline also, the direction must be strictly decided according to tactical units in view to increasing the effect of fire and diminishing the object exposed to that of the enemy.

If the attack dispenses with all halting on the way, if it moves upon an open and entirely exposed plain, we already know the principles of its conduct. Locally the defence is to be met by defensive action, and here only the artillery can assist the attack. The flank movement or attack which is to decide the affair must be awaited.

On the other hand, the more varied—in short the more "blind"—the country over which the attack has to be made, the more available is our old system of attack. The movement here is a forward one leading straight at the enemy. Columns are to be closed in and brought nearer to the firing line and the battle must be fought out with "telling" fire at close range.

The Division.

An Infantry division enters the fight in two brigades. The principles of its fighting are analogous to those of the smaller units. The relation between the flanks and the frontal deployment would require no further enunciation of principles were it not that, with the division, the handling of all arms comes into play. This unit comprising all arms completes the picture of the Infantry battle.

Independent as is the Infantry arm, it is unable of itself to extend, by reconnoitring, the horizon of its action. Single skirmishers, sent out as scouts immediately in front of its field of action, are its sole aids. Infantry patrols sent out to long distances have long since been proved ineffectual. Their observation, their report, comes too late for action. The division requires mounted reconnoitrers and, owing to the value of reconnoitring and information in war, the cavalry is its eye-sight, its noblest sense, without which it cannot act. Hence the mention of divisional cavalry in this essay.

If one considers that it is the particular function of the cavalry divisions* to carry out the reconnoitring on a large scale for the whole army, the divisional cavalry will be limited to collateral duties. Securing the action of the division in connection with other bodies is its main function. Keeping up communication with neighbouring corps, reconnoitring towards the immediate front of the division, and outpost duties, make considerable demands upon its activity.

Spoilt by habits acquired in peace time where, in manœuvres of all arms, with the few days to get through them in, Cavalry are generally formed in great strength, far too extensive duties are generally assigned to it at the commencement of a campaign.

This may easily bring about its early exhaustion in men and horses.

* The Cavalry divisions, each composed of 2 Cavalry brigades, are distinct from the divisional cavalry. (Tr.)

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On the day of battle it is the special function of the divisional cavalry to precede its division to the battle-field, to reconnoitre and report on the nature of the ground and its occupation by the enemy, to secure its flanks and discover those of the enemy. It can, in ground favouring concealment, continue its reconnoitring activity even in the vicinity of the infantry movements, by throwing forward single horsemen on the flanks of the Infantry, thence to gain a view of the enemy's flanking parties, which it might otherwise take an hour's fighting to discover.

The divisional cavalry must repress the impulse to gather laurels for itself by its own tactical action.

Its attack is, in most cases, incapable of deciding even a local success. As it, therefore, by its charge narrows the field of the much more decisive fire action, it either becomes a shield covering the enemy or a herald announcing to him the impending action of the division. It must also thereby interrupt its more important reconnoitring duties.

The Cavalry commander must, in constant close communication with the divisional commander, systematically push forward his scouts and fasten on to the hostile flanks, but for the most part renounce the glory of brilliant attacks.

The divisional Artillery is the fellow workman and, in many respects, the support of the Infantry. In the preliminary stage it plays at first the principal part.

It will have to put forth its whole power almost immediately. The time of individual action of batteries in the advance guard, and keeping the main strength of the Artillery in hand, is gone by. Here also the war of 1866 introduced a change of old principles.

The progress of this arm has been too great to allow of single guns being brought up to oppose it in the early stage of the engagement. They can no longer sustain an unequal conflict. On the other hand immediate preponderance of artillery reaps its reward in the effect it produces on the entire course of the action. With this, the division of our troops and the order of march, have been re-organized, the main strength of the artillery being placed near the head of the column.

Here also the fighting on the side of the defence needs little elucidation.

It has time and opportunity to choose commanding artillery positions, to strengthen these and those of its Infantry artificially, has full liberty of choice as to the best method of distributing its strength, in view to effective fire.

If the defence of the chosen front is here also the main point, still, on the unsupported flank, in open ground, some flanking batteries should be placed. On the defensive they form the best protection for the flank. The Infantry kept as a local reserve there, with a similar object, forms its natural support.

On the offensive there is no time for the splitting of hairs; the details of the ground are much less known, decision must be far more rapidly come to. As a rule the artillery will strive to get on the inner flank.

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It is at first the pivot flank and relatively remains so during the course of the movements. Hence the Artillery will, on this flank, be less compelled to change position, when its own requirements do not necessitate it. It here interferes less with the movements of the infantry and is less disturbed by them, for it is the outward flank which is most in movement.

If the ground forbids this arrangement by offering no clear field of fire, and, therefore, no effective field of action on this flank, this would not alter the principle. The more open part of the ground would then be assigned to the artillery for its deployment. There the batteries would find space for its fire-action which would be especially dangerous to the progress of Infantry.

In order to sketch out more graphically the working of the different arms acting on the offensive, an attempt will now be made to give an example of an attack by a division.

It moves in column of route to the battle field in a certain direction. It forms the left wing of those parts of the army already engaged.

On its own left flank it cannot expect support from the other division of the corps for some hours. With this other division is the corps commander with the corps artillery. It is marching along one road and the head of the column approaches the scene of action. The leading Infantry is beginning to deploy and to take up a preparatory position.

The divisional commander is to the front receiving the reports of the cavalry as they come in. He also receives reports of the state of the action of the left wing of the already fighting portion of the army. The danger is represented as urgent, as will probably be the case.

On the other side touch of the neighbouring division has been felt, and they will hurry on, but are still far behind, and must rest a little as they have marched many miles without a halt. The ground in front offers sufficient points of support for the attack. The right flank of the enemy has been discovered in front of the division. He does not appear very strong, the reinforcement of his front line having evidently diminished his reserves. The Commander determines to attack. He has full time to make his dispositions. The head of the division has been correctly directed and it takes over an hour to deploy the whole division from column of route. Word is sent to the division which is on the left of the portion of the force already engaged that support will be given to it without awaiting the arrival of the other division of the corps (now on its way to the field of battle) but that the division must complete its deployment to such an extent as to enable it to employ its whole strength in prolonging the fight. Report is sent to the corps commander that the division will attack at once, because it can ensure success, though it is aware that it will be without support on its outward flank for two hours more. The circumstances on the right wing demand quick relief. The divisional commander also begs that his left may be quickly supported by the corps Artillery; then the situation will be such that the attack may decide the fate of the day.

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Meanwhile the officer of the General Staff has given out orders in accordance with the instructions of the divisional commander to the assembled aides-de-camp and staff officers. The first brigade is to deploy for attack on the left of the engaged wing, certain designated points in front being occupied simultaneously with the deployment. The second brigade is to advance as supporting echelon on the extreme left of the division. The divisional Artillery is to take position according to the ground between the two brigades. Its action is to precede the Infantry attack.

The commander of the divisional Artillery has meanwhile selected positions for batteries. They form up and open fire. In this stage the hostile batteries only will have to be combated in order to prevent their hindering the deployment of the Infantry.

Covered by their fire the regiments of the first brigade take their prescribed positions. They are disposed side by side. No. 1 regiment on the right; No. 2 on the left.

The offensive movement begins. The 1st regiment, advancing one battalion, and the 2nd two, gain points of support in front. These may be rising ground, copses, or farm buildings. If these are occupied by hostile troops, the development of the fight will be different from what it is when only mass-fire from the main position is what has to be overcome. In the first case it is a matter of the conduct of a local offensive fight; in the second, local defensive action with formations adapted to the passive attainment of the object. The first regiment has the two battalions, which it has kept in hand, echeloned to the right rear, the second regiment has its rear battalion echeloned to the left.

Now objects for the attackers mass-fire present themselves. Without subduing these the attacking party could no longer gain ground. A concentrated fire must, above all, be poured upon those hostile troops who hinder a forward movement at a point where an advance is intended. The batteries have also to support the now visible objective of their Infantry, in so far as Artillery can do so, while opposing hostile Artillery fire.

The Infantry offensive can only look for success when the sister arm can, as it were, sweep clean the way before it. Under cover of this fire bodies of infantry are pushed forward to new positions, and the same procedure is repeated etc.

In this procedure it may have been observed that the batteries are not in their normal place. With the Artillery thus centrally placed, one arm easily interferes with the action of the other. The Infantry is easily hindered in echeloning its strength towards its outer flank, and the Artillery is easily brought to a position where it must fire over the heads of the Infantry. On the inner flank the batteries have, if they command the whole fighting front of the division, undisturbed room for their action as the Infantry then also have for theirs.

Meanwhile the battalions have reached the zone of individual firing and the fight becomes general. The battalions approach and their formations are assimilated. Locally this or that company will find itself in echelon as the battalion reserve, but on the whole there

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is no reason why both the regiments should not, in accordance with the principle we have enunciated, develop their full front of fire. The second regiment has still perhaps a battalion in reserve on the extreme outer flank.

In most cases the batteries must now go forward. At any rate the enemy's Infantry must now be their main object without regard to the losses they themselves may suffer. If they succeed in breaking their strength, the position must be evacuated. We must now follow the action of the second brigade.

The divisional commander had sent it the order to attack, on the commencement of the frontal attack. The Brigadier determines to attack with the 3rd regiment, keeping the 4th regiment in hand as a reserve on the extreme left flank. The attack progresses rapidly. The outer flank of the enemy seems won, when a hostile counterstroke from his right flank (that is opposite our left) stops his advance. The 4th regiment assumes, therefore, defensive action and repulses the attack. It was owing to the reports brought in by the divisional cavalry that the enemy did not succeed in his attempted surprise.

About this time the foremost batteries of the corps artillery come up from the rear and support the action of this left wing. The head of the left division now also appears in sight. The local offensive action of the enemy was a last effort preparatory to his retreat.

The divisional commander, who, from a position near the batteries, has been observing the progress of the fight, now gives the impulse for a general advance.

It is best if this is done by a pre-arranged signal, for instance, by the command to fix bayonets. Only for a general forward movement like this should any bugle call be permitted in Infantry fights. Then every bugler who hears it must take it up. Now everything must come into play, and in the general attack no portion of troops must remain behind.

In what formation the final assault is to be made must be decided locally on the spot. In swarms of skirmishers with supports in close order; in company columns; in line or column, according to the ground, all rush forward together to storm the enemy's position. Only order and discipline must be preserved; that is the main thing.

It would be a capital error to make any attempt, at such a moment, at changes of formation. If the position is won, if the enemy turn their backs, the *movement* of the attack ceases. The infantry pursue with their leaden missiles the retreating foe.

The first brigade has one battalion, and the second three (a whole regiment) at disposal wherewith to clinch the success by the occupation of the conquered position. This must be arranged in the first instance by the Brigadiers themselves, those troops engaged in the fighting line having on the other hand to regain their order.

A new battle formation has to be established. This is formed with the least confusion and delay from the troops hitherto intact.

On the right a battalion of the 2nd regiment, hitherto kept in reserve, has occupied the position and the regiment has rallied behind it.

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The 1st regiment is then echeloned to the right rear as right reserve echelon.

On the left, the 4th regiment is comparatively intact and ready, therefore the 3rd regiment is echeloned to the left rear.

In this sense the Brigadiers have thus to renew their preparations for action even while the enemy is still being pursued by a devastating fire from the position.

Nor until this is done are new dispositions practicable.

On the other hand, disorderly pursuit out of a position thus won is useless, and may even imperil the success already gained. For example, this fault was committed and repeated by both French and Germans in turn at Ligny. The ground that had been gained was thereby always lost again.

I willingly admit that the description of such an abstract action, even if correctly pictured, which neither contemplates any particular case nor any particular ground, is but of small value. Every thing does not in reality happen as here supposed. Friction is inevitable. Misunderstandings occur, faults will be made and commanders must take all these factors into account. This illustration of principles by a supposed case may perhaps, however, be made more intersting by a corresponding general description of what would happen if the principles laid down are *not* acted up to.

In the first place, on the march to the field of battle, owing to the local requirement for reconnoitring etc, the regiments of the advance guard have been obliged to break up into detachments.

On the left of the division lies a defile, which it is considered important to occupy. Two companies* are sent there. On the right lies a wood which the cavalry cannot sufficiently explore. Another company is required for this. Companies so detached will not be seen again before the action.

On the approach of the division a cry for help from the troops on the left flank, already engaged, reaches the advance guard. Its leader orders packs to be thrown off and hastens to their assistance. In his hurry he forgets to send a report of this to the rear. Hastening on in alternate quick and double march he reaches breathless the scene of the action.

The nine companies (for two battalions are already split up) rush into the fight on a frontage suitable for a whole division only. The first battalion goes straight on, for in its front lies its nearest objective. The second battalion hurries up on its left, otherwise it might fail to gather the laurel. The third even attempts to surround the enemy's right wing, for does not a flank movement always denote superior intelligence!! Between these comes the battery of the advance guard. It is in fifteen minutes rendered motionless being engaged by a superior artillery.

(* The strength of the German Companies should be borne in mind. Their war establishment is about 250 all ranks. (Tr.)

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When the divisional commander becomes aware that he no longer has an advance guard, he hurries after it. An hour later the heads of his columns reach the field of battle. There is no time now for consideration and for dispositions, as in the former case. His divisional artillery also finds that its proper place is occupied. In front dire distress, giving way, cries for support. In this way regiment after regiment hurrying up is interpolated just as it emerges from column of route into the long frontal fighting line. No leader has any longer a certain definite sphere of command. When the Commander of a regiment has disposed of one battalion here and the other there, in order to meet the pressing necessity, he has exhausted his last means of influencing the fight.

But even the battalion limits must be sundered by this three or four fold intermingled reinforcement. Companies try wherever they can to enter (shove into) the fight to the best advantage. Here sufficient force appears to be engaged already, the enemy's position appears too strong, so it must be turned, therefore, left incline is the word.

At last, no wonder, if leaders of skirmishers change themselves on their own account into generals. Certainly by this procedure most will hang about the enemy's outer wing. This working outwards to attempt flank movements is so popular that this idea is sure to occur to many at the same time.

The frontage is, however, hereby extended to three on four times its normal breadth.

A variegated admixture of regiments of all sorts of numbers* is fighting hand in hand in the front line, the leaders of high rank with them, and at length the last reserve is used up to stop a gap. The burning wish for distinction &c. was also a cause of this.

As long as the enemy's resistance is in itself hopeless, that is to say, when it must confine itself in accordance with the strategical situation to a pure passive defence, such a way of fighting goes comparatively unpunished. But even then it has it disadvantages. The whole mischief of this self-will does not shew itself until a retreat ensues, because then all means of control fail absolutely. This is what was referred to in the remarks in the Introduction to the effect that many of our practical men are more willing to take their stand on the fact of our great victories without considering that these were the result of the superiority of our operations, than to search into the causes of those rare instances where we were unsuccessful.

In two great overwhelmingly victorious wars our opponents have learnt, with dearly bought experience, what we knew. Our organization is copied, our operations are studied, and the correct study of war is the best teacher, especially when misfortune sharpens the understanding.

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* German Corps &c. are generally organized regularly thus :—
The 1st Corps would contain the 1st and 2nd Divisions.
,, ,, ,, ,, ,, 1st, 2nd, 3rd, and 4th Brigades.
,, ,, ,, ,, ,, 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th Regts. (Tr.)

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In future we can neither reckon upon superiority of numbers or of knowledge. Therefore he will be the conqueror who, among other things, is the best tactician.

After 1866 tactics underwent severe trials in regard to the employment of artillery. In 1870 reforms in cavalry tactics were demanded. The infantry soldier knows that his branch also must progress. He has only to abjure, on the one hand, the temptation to the love of mechanical inventions in the way of *formations*, and on the other to guard against ignoring the necessity of tactical cohesion and subordination and the consequent temptation to wilful independent action.

Scharnhorst in his tactical instructions wars constantly against these mechanical geniuses, and of late, mechanical prescriptions are of less use than ever.

The mind requires for the organization of the fight a few general rules of universal application reduced to the simplest form.

This was also the way indicated by the imperial cabinet order of the 19th March 1873.

The "Regulations for the conduct of troops in the field" must assist the field exercise book. They lay the greatest necessity on observing continually the above described method of subdivision of commands. Each one has his proper place assigned to him in and by the "Order of Battle"*

The independent action of subordinate leaders which is praiseworthy, and which should be inculcated in all instructions, is the faculty of executing of their own choice and initiative those manœuvres which their place in the order of battle or in the body of troops engaged requires. The non observation of this limitation, however, is no longer independent action, it is self-will. To be really independent a thorough knowledge of one's duty is necessary. Only within the prescribed limits of duty can a manly consciencious resolve be taken.

With Infantry too many independent functions have to fit in exactly in order to obtain unity of action. Such requirements necessitate routine for no one case exactly resembles the other.

The drill ground, the manœuvring ground, the riding exercises and the war game are the means which lead to perfection. On the other hand no one system of fighting will effect this; from its helplessness arises then that result of attempted self help, self-will.

Remarks on the Battle and Conclusion.

According to Clausewitz the defensive is the stronger tactical form.

The improvements in fire-arms work at first in favor of the defence, for the attacker, who in the first stage is the one first assailed by fire, is by his movements reduced to comparative defencelessness.

This fact has frequently led to the remark that the perfection of tactical science consists in bringing about a defensive battle under conditions favorable to success.

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* This is the organization of Corps, Divisions, Brigades etc on taking the field. (Tr)

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For instance, our opponents in 1870 seem to have adopted this as a fixed rule. The result of their experience may, however, lead us logically to doubt the truth of the axiom. If one could allow the theory of war to culminate in this:—"You should choose a strong and suitable position, entrench yourself up to the eyes, take your enemy in front and there shoot him dead" then useful generals would be more easily found than at present. Irrespective of the fact that such a proceeding cannot apply to the enemy also, and that you cannot always subordinate him to your will, such positions which every where prevent an enemy operating offensively, do not exist.

At a time when the essence of strategy consists in the arrangement of separate marches in view to well timed concentration, with the size of the armies, and the numerous roads which lead through cultivated countries, the strongest (locally) position loses its value. It is surrounded and has the enemy on both its flanks if it is not quickly abandoned.

Local combats, as at Thermopylœ, only ensue from the want of communications in uncultivated lands.

The expression of Clansewitz in its entirety, therefore, only means to describe the defensive as the strongest *negative* form, that is, where a *negative* object has to be attained. The quick and summary course of our great wars which utilizes at one and the same time all great roads of a district, a *positive* object has become, in the case of a continental war, indispensable of late. Movement and the utilization of all means of furthering the operations becomes in so far here the main thing that, with the tactical conclusion, they form an inseparable whole.

This explains why we had no special battle dispositions.

The *positive* treatment, its offensive spirit, can, therefore, less than ever be dispensed with. The training of our troops must now, as ever, be chiefly directed towards solving the difficult problem of the attack.

The last consequence of the position principle led to uniform fortification of the whole frontier. In the central situation on the Continent of the German Empire such an idea would, however, be impracticable, even had we the inclination and the money. Movement only, and making good use of all communications, can be of service to us in the moment of danger from a combination of hostile states.

Obviously tactical action against the enemy's exposed flank is the most favorable situation for infantry. We have seen that this cannot be effected by lateral movement of our forces on the battle field itself. We may thank the course of our operations for our having debouched opposite this flank in our great battles.

At Königgrätz we hung on both exposed flanks of the enemy in such a way that any offensive counterstroke on his part must lead to a fresh outflanking by the forces opposed to him. The possibility of victory was excluded from the calculation. The Austrian Artillery was superior to ours but the Infantry was indebted for its great success more to the general situation than to the superiority of its weapon. Here such instances of wilful independent action as occurred in the fighting scarcely weighed in the balance.

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At Gravelotte the German forces, owing to the reversion of the fronts of both opposing armies, came upon the outer flank. With its back to a fortress, the French army had full liberty of operation. But, however strong the position, though so called short offensive returns might locally create a temporary panic, they were of no avail to shake off the enemy. With the battle of the 18th began the actual siege, brought about by the inclination of the enemy to a war of positions.

The German Artillery was superior, but the better breech-loading rifle of the hostile Infantry had caused immense loss. The situation was grave. It was seen that *stricter discipline in action was required in the, now of necessity, extended formations.*

At Sedan the gaining of the exposed flank was carried to the extent of complete envelopment.

The experience of the preceding battles had been useful. Entry into the scene of action was made in accordance with the order of deployment.

The deployment from column of route was carefully done. Time was given for the Artillery to open the ball. Local losses were considerably lessened.

Every where the general idea of the operations had led the victor against the enemy's outer flank. It is a necessary part of our representation of the Infantry combat to make this quite clear, and to correct the erroneous idea that *tactical* surrounding could have effected this object. The deep columns of Infantry are incapable of *surrounding*, in a tactical sense, the present extended front of battle.

The very fact of having a concentrated force on the extreme outer flank gives of itself evidence of superior operations.

Still no absolute rule is to be deduced herefrom. That would be weakness. It would lead to undue extension of the *strategical* front.

Defeat of the separated parts by concentration of our own forces upon interior lines then forms the means of counteracting this.

Decided positive action may also, by strategically working on interior lines, gain the extreme outer flank of the field of battle.

Only on the field of battle itself is the possession of the inner flank disadvantageous.

For example, the Prussian army in 1866 could only march from Torgau by Görlitz and Neisse upon Gitschin, because they knew the Austrian army was in Moravia, and Torgau, their furthest point, was the same distance fron Gitschin as Olmütz.* Had the main body of the Austrians been already in Bohemia then the idea would have been faulty. Benedek might then have defeated the separated parts in detail.

Even if the course of the operations leads to the gaining the outer flank or to acting on interior lines, the *tactical* rule for the conduct of troops is a wide front, supported in echelon towards the outer flank, for frontal fire has become very strong. Once (deployed) extended, all offensive movements are made direct to the front.

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* The Austrian Army was concentrating about Olmutz. Tr.)

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One's own outer flank not only requires a reserve but it is there best placed for the further development of the attack. This measure renders possible that kind of flexibility which infantry alone is capable of during a fight. But in the battle of great masses, that body, which in minor tactics we designate a flank echelon, is here of the strength of an Army Corps.

Now it is no longer necessary to treat of the fighting of an Army Corps in detail. It is simply the combat of two divisions, directed by the single will of the general who commands them both. In the use of the Corps Artillery the means of giving full effect to the intention of the general are found.

The Divisions are, however, the supports of the pure tactical treatment, while commanders of armies have in their eye the grouping of their forces on a large scale and the keeping in hand of reserves. With a breadth of front extending several miles, the modern field of battle comprises several square miles and includes within its sphere sometimes 30 different places.

Consequently a number of local tactical problems may offer themselves, the solution of which cannot be personally supervised. It is impossible to give a uniform character to the conduct of the action by battledispositions as Napoleon I. did.

Hence for troops on the offensive, deployment and fighting are no longer separate affairs. These functions are merged, the battle being simply the last product of the operations.

The important tactical local (actions) decisions which go to make up the battle are consequently in the hands of the Divisional Commanders. Each has to consider the special function of his division as a wing or centre body, his relation to the neighbouring corps, the enemy's situation, and the character of the ground allotted to him, and then has to make his own dispositions accordingly. Here a neighbouring corps has to be supported by a rapid advance, there the deployment of an outer wing is to be awaited, in a third place, the open plain lying before the enemy forbids, for the moment, any further advance.

With a very powerful artillery the progress of the neighbouring corps on the outer flank must be awaited in order to obtain tactical overwhelming superiority of fire etc.

In short, in the face of such varied tactical functions, the attempt to give a uniform character to any battle must fail. All the more, therefore, must the action of the different units be governed by the general idea of the battle.

This also demands a higher degree of training and more intelligent supervision.

At the commencement of the battle we imagine the cavalry Divisions, which have hitherto covered the front, to be now in front of the flanks. The outer one, especially the manœuvring flank, will require it in its forward wheel. Its most important function is to reconnoitre the enemy's front, especially the extremities. The outer wing of the

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line of battle can only act decisively, that is, with its whole strength, if the result of this reconnaissance is reported to it in good time during its advance.

In conclusion, let us picture to ourselves the reserve echeloned outwards behind the flanks. It is almost always useless behind the centre of the line of battle. With the normal extension of front the centre is the least exposed point, and presumably the most difficult point in the enemy's line to assail, is opposite to it.

Even in the case of a retreat the position behind the centre is questionable.

The march and deployment from centre to flanks may easily occupy a whole day.

This was the case with the French on the 18 August. (Gravelotte). From the outset the reserve should have been behind the exposed flank.

For the employment of the reserve a uniform formation is frequently asked for. Our regulations for the conduct of troops do not accord with such an idea, and there is apparently no reason, why, on this occasion, the liberty of disposing his troops as he wishes should be taken from the Commanding General. Clausewitz certainly gives a normal formation for an Army Corps in reserve, and says himself, if I mistake not, that it is an assistance in the time of necessity. He doubts, namely, if the amount of tactical training of the lower grades admits in such a case of united action by simple directions to act according to the circumstances of the case. However, the great thinker had not lived to see the extended order necessitated by the breech-loader.

A higher degree of training down to the lower grades is necessary for the new method of fighting. The object of the work in which we are engaged is especially to call forth, to cultivate, to elevate the spirit of self-reliance, but to check self-will. It would, therefore, be wrong to give a rule for a special case that could not be made of general application. The fight, as regards the use of last reserves, differs in no way from what has already been laid down for the infantry combat. The commander allots to each division its task, designates the point of attack or method of defence, and the Divisional Commander makes use of his division in the usual way, methodically, according to its organization.

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V.

A NEW AFGHAN QUESTION

BY

H. W. BELLEW C. S. I.

Sanitary Commissioner, Punjab,

BEING THE TEXT OF TWO LECTURES DELIVERED AT
THE UNITED SERVICE INSTITUTION OF INDIA,
Simla, September 1880.

By the rules of this Institution the discussion of Political subjects in its public proceedings is prohibited.

It is not, therefore, with a retrospect of our past relations with the Afghan Government that I now propose to engage your attention; nor with a survey of our present situation with that People; nor yet with a forecast of our future prospects in their country.

Neither the instructive lessons of the one, nor the interesting issues of the other, nor yet the important bearings of the last, come within the scope of the Afghan Question which is just now in my mind.

Ladies and Gentlemen.

ARE THE AFGHANS ISRAELITES?

Are the Afghans Israelites? That is the question, if not of the day, at least of the present occasion.

But some may very naturally enquire—What occasion is there to ask such a question at all? To this I have a ready reply—a decidedly more ready one than to the original query—and would say, the occasion arises from the simple fact that the Afghans not only consider themselves, but proudly claim to be of a people, who, after a very remarkable career, have disappeared from the page of history and, so far as their mere identity is concerned, have been lost to the world for upwards of two thousand five hundred years.

But apart from this. The occasion arises the more particularly at the present time by reason of the new interest awakened at Home by the,—well, not yet claim exactly, but—advocacy during the past few years, by some thoughtful people in England, of the identity of the British Nation with the Lost Tribes of Israel.

I will not now venture on a discussion of this Theory, nor attempt to weigh the merits, or foretell the tendencies of this remarkable advocacy. Nor will I further notice the Identity Movement in England more than to say that the investigation of the subject which it has provoked,—through the multifarious publications of "The British Israel Identity Corporation, Limited,"—has already produced a deal of very curious and highly interesting information, good and bad together, regarding all that relates to the peculiar and God-favoured nation of Bible History.

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Let us proceed to consider the Question now before us.

Are the Afghans Israelites? They say they are, and have, moreover, preserved a detailed traditionary account, such as it is, of their Israelitish descent. I do not intend to afflict you with a recital of the genealogical tables in which they pride themselves, nor with a relation of the legendary tales in which they repose a ready belief. But I must allude to an important feature in their Israelitish claim, notwithstanding the anachronism connected with it, and which will appear presently when I come to the tradition of their early history. This important feature is the fact that the Afghans claim to be Israelites but not Jews, though they admit that the Jews are Israelites also. That is to say, the Afghans hold that all Jews are Israelites, but that all Israelites are not Jews. In other words, they fully recognize the distinction between the House of Judah and the House of Jacob, or "Israel." And claiming themselves to be of the latter, they consider that they are a peculiar and God-protected people with a glorious future before them.

The Afghan account of themselves as a distinct people is a very remarkable one. Partly by reason of the extraordinary confusion of well known historical facts; but mostly by reason of the interpolation of manifestly fictitious details and puerile tales with which it is loaded. Their accounts comprise two distinct series of traditions, the one relating to their history as Israelites; the other to their history as Muhammadans.

With the latter we have now no concern. And with the former I can deal only most briefly, though the story is a most interesting one, and recounts, in more or less altered versions, many of the events and names recorded in our Bible, especially in the Books of Kings and Chronicles. Time will not allow of our discussing this subject now. But I may say that their story, told in very brief words, is to the effect that their ancestors were descended from SAUL, the son of Kish, whom they çall *Sárúl Malik Twalút*, "Saul the Prince of Stature"; that they were settled as Israelites in the country of *Shám* or SAMARIA; that they were thence carried away into captivity by Bukhtuna Sar, who is supposed to be the same as Nebuchadnezzar, king of Babylon, who destroyed Jerusalem and carried away into captivity, not the Israelites, but the two tribes of the Jews, whom he settled at Babylon. This is the anachronism to which I referred just now, for the Israelites, as a separate kingdom from the Jews, had already been carried away captive a full century and a quarter, or about 130 years, earlier. Josephus informs us (Book X ch: 9) that when Nebuchadnezzar took away the two tribes to Babylon "he planted no other nation in their country," as had been done by Shalmanasár when he removed the Israelites out of their country, "by which means" he says "all Judea and Jerusalem, and the temple, continued to be a desert for seventy years." This last captivity by Nebuchadnezzar was the final stroke which put an end to the Hebrew nation, and as such, probably, left a deeper impression upon the minds of all Hebrew peoples than the previous captivities of the ten tribes of Israel. And thus we may understand its taking the first place

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in the Afghan traditions as the great event which marked their complete severance from the fatherland, and their complete destruction as a nation.

However, be this as it may, the Afghan account continues to the effect that their captive people were settled by Nebuchadnezzar in different parts of his dominions; that in these places they increased in wealth and numbers; that they then revolted and escaped to the inaccessible mountain retreats of Ghor; and finally, that they established themselves there and maintained themselves in security against the peoples of the surrounding countries.

In Ghor, their accounts say, the Afghans continued to abide as Israelites observing the Law of Moses, which they call *Taurát*,—"the two tables," or "ten commandments,"—and increasing in strength and wealth, till the appearance of Muhammad as the Apostle of God, and their immediate conversion to his Doctrine, drew them from the country of their refuge, and extended their borders into the territories of their neighbours.

After this period the history of the Afghans is lost for some centuries in that of the early invaders of India, till, at last, they appear by name as an important element in the conquering armies of Mahmùd, the Ghaznivide, at the close of the tenth century. The Afghans thenceforth steadily increased in fame and influence, till, finally, in the fourteenth century they gave a dynasty of kings to India, and covered the country with their feudal baronies and military colonies, the descendants of whose people exist to this day in most parts of Northern India and even in the Dakhan.

But just now we are not concerned with the history of the Afghans except as Israelites. We must, therefore, confine our attention to the early traditions of their captivity, escape, and settlement in Ghor, which I have referred to just now.

Let us see what support history affords to the truth of the Afghan statements of their Israelite origin and early history. Naturally we first revert to the earliest traces or records of Israel as a nation. These are preserved to us in the Bible.

In the Second Book of Kings, chapter XV, v. 29, we read. "In the days of Pekah, king of Israel, came Tiglath Pileser, king of Assyria, and took Ijon, and Abel-beth-maachah, and Janoah, and Kedesh, and Hazor, and Gilead, and Galilee, all the land of Naphtali, and carried them captive to Assyria."

Here I would ask you to bear in mind the three names Pekah, king of Israel, Hazor the town or district of Israel, and Naphtali the tribe of Israel, as I shall have occasion to refer to them again later on.

The event described in the passage I have just quoted is also recorded in the first book of Chronicles, chapter V, v. 26, in these words. "And the God of Israel stirred up the spirit of Pul, king of Assyria, and the spirit of Tilgath Pilneser, king of Assyria, and he carried them away, even the Reubenites, and the Gadites, and half the tribe of Manasseh, and brought them unto Halah, and Habor, and Hara, and to the river Gozan, unto this day."

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From the brief notice of this event by Josephus (Book IX. chapter III), we learn that this Pekah, who reigned as king of Israel for twenty years, was previously only the General of the Horse of King Pekahiah, the son and successor of Menahem, and that he usurped the kingdom from his sovereign after treacherously causing him to be slain at a feast. Menahem himself, we are told by this author, had seized the kingdom from one of the king's own domestics named Shallum, whom he attacked and slew, because he had murdered his sovereign the king Zachariah, son of king Jeroboam, in whose service he (Menahem) held the important position of General of the Army. Thus the kingdom passed rapidly from the hands of one usurper to that of another, for Pekahiah reigned only for two years, and Shallum for only thirty days, till it was finally broken up and the Israelites carried away captive by Tiglath Pileser, as we have just seen. According to Josephus, Tiglath Pileser in this expedition against the Israelites "had overrun all the land of Gilead, and the region beyond Jordan, and the adjoining country, which is called Galilee, and Kadesh, and Hazor; he made the inhabitants prisoners and transplanted them into his own kingdom."

This country of Hazor—I would wish to draw attention to this point—was an important, if not the most important, district in the land of Naphtali. Its chief city bore the same name, and one of its principal towns was called Cabul. To the west of Naphtali was Galilee, the land of Asher; and to the south lay the land of Zebulon, or in modern phraseology, the country of Zabul; to the east was the land of half the tribe of Manasseh; and directly south of this again was Gilead, the land of the tribes of Gad and Reuben. I mention these particulars because these were the tribes of Israel which were carried away by Tiglath Pileser, and the names of some of them, as well as of their dwelling places, are still found, very slightly, if at all, altered, amongst those of the principal Afghan tribes and their dwelling places of to-day.

Now the captivity of Israel recorded in the two quotations I have made from the Bible was not complete for all Israel, but only for the tribes of northern and eastern Israel; and it took place, you will remember, under the king of Assyria, who is variously named Tiglath Pileser, Pul, and Tilgath Pilneser, about the year 740 B. C. The real—or family—name of the Assyrian king was Pul or Pil, (=the *Hindi* Pal,) the Tiglath or Tilgath and the-eser and-neser being merely titles. The first, like the *Dughlát* of the modern Turk peoples, may be a military title prefixed to the name proper; whilst the second, most probably, like the *Sár* of the Georgian Princes and the *Tsár* of the Russian Emperors, or the *Shah* of the Persian kings, is the native title of royalty—appearing here in the forms of its grammatical inflections—which was common to the sovereigns of Assyria and Babylonia, as in Baltasàr or Belshazzar, Salmanasàr or Shalmaneser, Nabopolassar, Neriglissar, &c.

Now for the captivity of the rest of Israel. We read in the second book of Kings, ch. XVII, v. 6,—"In the ninth year of Hoshea the king of Assyria took Samaria and carried Israel away into Assyria, and placed them in Halah, and Habor, the river of Gozan, and in the cities of the

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Medes." This event is again recorded in the tenth and eleventh verses of the following chapter. And from them we learn that this second captivity of Israel took place under Shalmaneser, king of Assyria, after a seige of Samaria which lasted three years. The date was about twenty years after the first captivity under Tiglath Pileser, or from about 723 to 721 B. C. This expedition against Hoshea completed the destruction of the Israelite kingdom and the captivity of the rest of Israel; and they were planted in the same places as their brethern of the first captivity.

According to Josephus (Book IX, ch. 13) Pekah, the king of Israel at the time of the captivity by Tiglath Pileser, "died by the treachery of a friend of his, whose name was Hoshea, who retained the kingdom nine year's time." Thus it would appear that the successor of Pekah as king of Israel was also an usurper like himself and his predecessors. Saimanasar in this expedition against Samaria, the capital of the Israelite kingdom, "quite demolished" says Josephus "the government of the Israelites, and transplanted all the people into Media and Persia, among whom he took king Hoshea alive; and when he had removed these people out of their land, he transplanted other nations out of Cuthah, a place so called (for there is a river of that name in Persia), into Samaria, and into the country of the Israelites." Thus, after an existence of 254 years from the division of the Hebrew nation into the kingdoms of Judah and Israel, under Rehoboam and Jeroboam respectively, was the house of Israel destroyed and the peoples carried away captive.

The places in which they were planted,—Halah, and Habor and Hazor, by the river Gozan,—have been identified with the modern places named Alamut, and Abhar, and Hara, all situate in the district or country drained by the river Ozan, or Kizil Ozan, which empties into the Caspian Sea to the North West of Tehran, the present Persian capital, which stands not far from the site of the ancient city of the Medes, named Rhages or Rai, in which Tobit, of the tribe of Naphtali, found some of his kinsmen. Here, then, and in the cities of the Medes we find the captive Israelites located in the year about 721 B. C.

Ten years later, or a full generation after the first captivity, occurred the revolt of the Medes; and the overthrow of the empire of Sardanapalus very quickly followed. In the course of this revolution captive Israel escaped and dispersed.

Where did they go? What became of them? We may well ask. For from that time to this they have been lost to the world as Israel. These are very important questions and full of the weightiest interest, not only from a historical but also from a Biblical point of view. And they are questions which at this very time are engaging the earnest attention of many sound and thoughtful people in England, and actively exercising their ingenuity and research for a satisfactory solution.

That captive Israel did escape from their bondage in Media we are assured not only by the traditions of the Afghan Israelites themselves, but also by the prophet Esdras (2 Esdras, ch. XIII, v. 40 to 46.), who as the result of a vision, describes the first migration of captive Israel in these words. "Those are the ten tribes which were carried away

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prisoners out of their own land in the time of Osea the king, whom Salmanasár, the king of Assyria, led away captive, and he carried them over the waters, and so they came into another land. But they took this course among themselves that they would leave the multidude of the heathen, and go forth into a further country where never man dwelt, that they might there keep their statutes which they never kept in their own land. And they entered into Euphrates by the narrow passages of the river. For the Most High then showed signs for them, and held still the flood till they were passed over. For through that country there was a great way to go, namely, of a year and a half; and the same region is called Arsareth. Then dwelt they there until the latter time."

This migration, you will observe, refers to those of the ten tribes who were taken captive in the second invasion of Israel, under Salmanasar; and probably the migration commenced early in the spring of 710 B. C., immediately after the overthrow of the Assyrian authority.

By some(Forster and others)the country to which these escaped Israelites went—Arsareth—has been supposed to be the modern Hazarah in Afghanistan. But from the route taken westward across the upper course of the Euphrates we should rather look further in that direction for the new country of their dwelling. And this country is considered by some advocates of the "Identity" to be the region watered by the river Sereth in Moldavia.

However, be this as it may, it would appear that whilst Israel of the second captivity (Hoshean or Osean) were thus escaping to the westward, their brethern of the first captivity (Pekahan or Pakhan) were effecting a like freedom to the eastward; both parties setting out from a common starting point,—the country of the river Gozan and the cities of the Medes,—but the one proceeding eastward having a far easier route to follow, and a far wider range to roam, than their kinsmen who had struck out their path westward.

With the Israelites who proceeded westward we have just now no concern. Let us see what we can make out regarding those who proceeded eastward—regarding the Pekahan Israelites. Assuming, then, that they started on their migration some time in 710 B. C.. after they heard of the success of the departure of their brethern towards the region beyond the Euphrates, and supposing that they could not overtake them owing to the natural difficulties of the country, or the opposition of the Medes, or some other obstacle, we may conclude that they took the easiest way of escape open to them; namely, the grand highway or caravan route towards the east along the south of the Elburz range of mountains—the modern highway from Tehran to Mashhad (the ancient Rai and Tús)—and onwards to Marv and the country watered by the Oxus.

Starting from the Israelite settlements on the river Gozan—the modern Kizil Ozan—we may follow their course along this route and see them arrived, after a march of a few weeks only, at Mashhad on the extreme eastern limit of the country of the Medes, and on the threshold

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of a new world beyond—the vast regions of Tatary. Here, at the point of junction between the two great races of Asia—the Arian and the Turanian—we would find them, the Shemite Pekahans, arrived at that gap in the mountain barrier which separates north and south Asia where the elevated plateaux of Persia and narrow valleys of Afghanistan pass through and merge into the basin of the Oxus and the wide steppe of Turán. Here also—at Mashhad—we should find them, the Pekahan Israelites, arrived on the immediate borders of that country to which the Afghans say their ancestors fled for refuge on escaping from the captivity in Media. That country is called Ghor in the Afghan traditions, and is described as situate immediately to the east of Herat. It is now most commonly known by the name of Hazárah.

In mediæval times the country of Ghor rose to distinction as the seat of the sovereigns of the Ghoride dynasty; a native dynasty which supplanted that of the Ghaznivide sovereigns by the aid of the Afghans, and which was in turn overthrown and succeeded by a dynasty of the Afghans themselves, who afterwards extended their power into India and placed their own kings on the throne of Dehli.

It was in the time of the Ghori sovereignty that the Mongols of Changhiz Khan invaded Ghor, and it was in the time of their successors of the Afghan sovereignty that the name of Ghor gave way to that of Hazarah. It is important to remember this, as I shall refer to the subject later on.

Well, in this mountainous province of Afghanistan, the refugees from Media, we are told by their traditions, dwelt in security as Israelites observing the Law of Moses, until the time of their conversion to the Mahammadan religion, or Islám, about the middle of the seventh century of our era. That is to say, the Afghans dwelt in the mountains of Ghor for full thirteen hundred years almost unknown to the world, until their conversion to Islam brought them into mention on the page of history in connection with the Arab conquests in Persia and India. When, as we learn from the early Muhammadan writers quoted in Elliotts "Histroy of India," there were Israelites dwelling in Ghor, and Jews in Kandahar as late at least as the eighth century.

This testimony is confirmed in a remarkable manner by the recently discovered Manuscripts of the celebrated Jewish Rabbi, Moses Maimonides, who was born at Cordova in 1131 A. D., and which prove that there were recognized Israelites in Afghanistan and Turkistan as late as the twelfth century.

In a weekly paper published by the British Israel Identity Corporation, and entitled "The British Israel and Judah's Prophetic Messenger," there is an interesting notice of these newly discovered manuscripts. From this notice (Messenger No. 24.) it appears that Moses Maimonides "in a commentary on 2 Kings, XVII, 11, viewed in connection with the first nine chapters of Chronicles * * * * commences with Israel carried captive to the river Gozan and the cities of the Medes," and follows out their dispersion amongst the nations. "He says," as I extract it from the article alluded to, "he has before him,

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and quotes at length, a Genealogical Roll of Israel which had been kept at a Synagogue at Samarcand, and which contained an account of the various countries where the various tribes, and the families of which they were composed, dispersed. He says that this Roll was kept for over six hundred years at Samarcand, but the Tartar invasions caused the custodian of it, fearing its destruction, to come to Persia, and eventually to take refuge at Toledo."

Here I would observe that the existence of this Genealogical Roll of Israel at Samarcand so late as the twelfth century fully accounts for the Israelitish traditions of the Afghans surviving the vicissitudes of centuries; whilst its transportation out of the country into Europe fully explains the confusion of names found in the existent genealogical lists of the modern Afghan nationality. Maimonides, as the article from which I continue my quotation says, "employed the custodian of this Roll, whose name, he says, was Jacob ben Israel, of the tribe of Simeon, to make a journey, which lasted twelve years, to visit all the countries named in the Roll, where the dispersed of Israel were, * * * * At the conclusion of this long tour, Jacob ben Israel came back with an immense amount of information relative to the various Lost Tribes, and Maimonides gives about fifty pages of the notes of this traveller whose peregrinations exceeded those of Marco Polo." According to Jacob ben Israel, his own tribe, "the Simeonites were partly in Khorassin, Afghanistan, and Turcomania, namely those of Mibsam in Khorassin, Zacchur in Afghanistan, and Meshobab in Turcomania (see 1 Chron. IV.)," He also states that "the Reubenites went partly to Asia Minor, Muscovy, and Scythia, the families being distributed as follows:—In Asia Minor the children of Joel (1 Chron. V. 12.). Shapham's posterity went to the Don * * * * In Tartary were the posterity of Meshullam and Buz: * * * * The Benjamites were to be found in India, China, and Afghanistan principally. After the time of the Babylonish captivity a portion of them refused to return with the Jews to Judea, and dispersed themselves over Media. The Arab conquests induced them to go eastward to Afghanistan, Central Asia and China. They became principally wandering Merchants, and preserved the Mosaic faith. The remainder of Benjamin went with the Jews back to Judea, and have been incorporated with them ever since." The Benjamites, therefore, will have nothing to do with the Afghans.

The account which the Afghans give of their conversion to Islam at the hands of a special apostle, whom they call Khalid bin Walid—a Syrian chief of the Curesh tribe of Arabs—is very curious and interesting. I cannot now stop to refer to it further than to observe that the story indicates either the existence, prior to the appearance of Muhammad, of a continuous inter-communication between the Pekahan Israelites and their kindred peoples in Syria, or else a recognition by them of their national and religious relationship. In either case a circumstance which at once explains the ready acceptance by the Afghans of the Law of Muhammad, their "Last Prophet of the Times,"—since it was but a revival of their own Law of Moses, which for upwards of six centuries had been outstripped by the fast spreading religion of Jesus Christ.

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From the Afghan tradition of their captivity by Bukhtunasar, before referred to, it would appear that they maintained communications from their refuge in Ghor with their brethren still in captivity in Assyria and Babylonia till long after the destruction of the temple at Jerusalem and the break up of their Hebrew nation by Nebuchadnezzar and his successors between 607 and 588 B. C. And it seems probable that at about this period they were joined by other Israelites who may have preferred to seek a new home rather than to return to their native land which had been peopled by other nations on their own removal into captivity. For we know that when Cyrus, the king of Persia, about half a century after Nebuchadnezzar, liberated the people of Israel to return and rebuild the temple of Jerusalem, the number of the whole congregation of the Israelites who did return to their native country was (Ezra II, v. 64, 65.) only 42,360, besides their servants and followers, who numbered 7,337. Whereas the number of the entire captivity of Israel and Judah must have amounted to several millions of souls, since at the census taken by David the number of the Israelites who were able to bear arms and go to war was 900,000, without counting the tribes of Benjamin and Levi.

Now let us return to our notice of the Pekahan Israelites escaping from their captivity in Media.

It is an interesting enquiry, whether the Afghans who took refuge in Ghor comprised the whole body of the Pekahan Israelites, whose migration eastward we traced awhile ago as far as the borders of the present Afghanistan and the Turkman steppe, or whether they constituted only a portion of that numerous company. For there are some good reasons to believe that it was only a small party of these Israelites who stopped short in their migration to settle in Ghor; whilst the main body—probably a multitudinous company—proceeded onwards along the route before them; down the course of the Tajand river, on to the wide plains and inviting pastures of what is now the arid wilderness of the Turkman steppe; and thence gradually spread over the extensive regions watered by the rivers Oxus and Jaxartes.

What induced the Afghan party to turn aside from the easy route ahead, and to penetrate into the difficult and inhospitable mountain fastnesses of Ghor, in preference to the equally near and far more accessible plains of the steppe country, can now be a matter of speculation only. Whether it was that they quarrelled and separated from their companions in flight; whether they were attacked by pursuing Medes and thus unwillingly parted from their brethren; or whether it was that they were driven into the hills by the hostility of the people of the country through which they were passing, is immaterial so far as affects the main fact with which we are just now concerned—namely, their actual presence in Ghor.

But before we take up the subject of the Afghans after their arrival in Ghor, it is desirable that we should first consider what became of the main body of the migration. Indeed this is a very important point in the enquiry, because we have evidence of the existence, in subsequent centuries, of nations, in these very steppe regions of the

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north country, which showed some very remarkable and unmistakeable signs of an Israelite origin. And not only so, but we find in Afghanistan to-day several tribes sprung from these nations, the people of which, whilst disclaiming descent from the Afghans, still consider themselves to be Bani Israil—"children of Israel;" whilst a current tradition among the Afghans themselves runs to the effect that, the Bani Israil came into their present positions here at two different periods and from two different directions; the first migration being from the west into the country of Ghor or Hazarah; and the other from the north into Kabul and the valley of the Indus. Let us see what history tells us of these northward nations, and note the main points relating to their Israelite origin. The subject is so wide a one, ranging as it does over the extent of the Asiatic and European continents, that I can here only attempt a most cursory and brief notice of that portion of it merely which is directly connected with the question under our immediate consideration.

For this purpose it will be convenient to return to the migrating Israelites where we last left them—on the borders of Ghor, and at the gap in the mountains which gives passage from the countries of Persia and India to those of Turkistan and Tatary.

From this point, then, we may trace the course of these Israelites down the valley of the Tajand river on to the wide plains of the Turkman steppe to the north of the present Merv. Arrived there, we may suppose that they soon adopted the only mode of life suited to the character of the country, and naturally reverted to the nomad habits of their forefathers in the wilderness of Sinai—the remembrance of which was kept alive in Israel by the ordained commemoration of the "Feast of Tabernacles"—and there builded for themselves the old familiar "booths" or *Succoth* (see Genesis, ch. XXXIII, v. 17. also Leviticus ch. XXIII, v. 33 and 34).

On these steppes, now, we must suppose these Israelites—under the name of *Succothi* or *Scothi*, "booth dwellers"—to have increased and multiplied; to have conquered and incorporated with themselves as subject or servile tribes—or at least to have gained the ascendancy and dominance over them—the previous Turanian or Tatar populations of the country; and gradually to have spread all over the wide region watered by the great rivers Oxus and Jaxartes, under a monarchical form of Government, with subordinate princes. In these regions they must have acted vigorously for their own protection, and revived the martial spirit and warlike propensities which characterized their daily life in the home country. We may conceive also the occurrence of occasions which called for stern and rigorous treatment, when, prompted by the instinct of self preservation, they became animated by the true Israelitish spirit of old, as manifested by their forefathers under Joshua, and slew all the males of their vanquished foe. We may understand thus, how they took to wife the women of the country, and so became infused with the Tatar blood and features by which several of the nations descended from them are now marked.

In this manner, growing rapidly in power, wealth, and numbers, we must suppose them spreading onwards to the east over the plain country

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on the northern and southern sides of the Celestial Mountains up to the frontiers of China; and in the opposite direction, through the southern parts of Russia, to the country already occupied by the Osean Israelites—their brethern of the captivity who had in the first instance (2 Esdras, ch. XIII, v. 40 to 46) migrated westward from the river Gozan by the narrow passages of the Euphrates, as I have before mentioned.

And thus we find that, after the lapse of less than two and a half centuries, the dispersed of Israel formed a company of distinct though kindred nations, which branched off one from the other, and came to be known, first to the Greeks by the common appellation of *Succothi* or *Scothi*, under the different etymological forms in which we meet with that word;—such as the native *Sagatai*, the Greek *Skuthai*, the Latin *Sagatæ*, and our *Scyth* or *Scythian*. To explain the derivation of these names I must refer back to the Israelites living as nomads on the Turkman steppe, and the allusion I then made to their "booths" or *Succoth*. We can now understand that they came to be called, both amongst themselves and their neighbours, by the name of that dwelling, namely *Succothi or Scothi*—"booth dwellers." Just as we see at the present day in the case of the "traveller" tribes of Afghanistan, who are called, and call themselves, *Kúchí*, from the Persian *Kúch*—"a march" with bag and baggage, and in that of the "wandering" tribes of Turkistan called *Kirghiz* or *Cirghiz* from the Turki *cir*, "a plain," and *ghizmác*, "to wander."

The *Succoth*, or "booths," of the Israelites were probably portable dwellings similar to the *Acoe*, the *Khargáh*, or the *Kibitkah* of the modern nomad peoples of Central Asia; or perhaps they were mere sheds made of reeds and branches supported upon poles, the walls being formed of a wattling of withies worked in pieces of a portable size. These latter are still in use by some of the migratory tribes of Balochistan, Sistan, and the adjoining districts of Afghanistan. I may here note that, in modern Arabic, the word *Zaghath* means a bundle of reeds, twigs, branches, and so forth, both green and dry mixed together, such as would be used in thatching a shed. Possibly the word may have some affinity with the *Succoth* of the kindred Hebrew.

The suggestion of the word *Succoth*, "booths," in connection with the nomadic life of the Israelites on the steppes of Tatary, was first made by Colonel Gawler, Keeper of the Crown Jewels,—who is a prominent advocate of the British Israel Identity theory— as a means of explaining the etymology of the word *Skuthai*, which is used by the ancient Greek writers as the national appellation of the nomad peoples of those northward countries.

Since its introduction into literature the word has been used in a very loose sense, and been generally employed as the common denomination of any or of all the northern nomad nations of ancient times, back even to remote antiquity. But we learn from Herodotus that the word *Skuthai* had a special signification as the national appellation of a particular people—the Royal and the Free Scythians—in distinction to others who were either incorporated with them, nationally or territorially, or else connected with them by neighbourhood and community of habits of life.

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According to Colonel Gawler, the word *Skuthai* has no meaning in Greek, and is evidently the Greek form of a native word, which he considers to be the Hebrew *Succothi* or *Scothi*, "dwellers in booths." From this word *Skuthai* of the Greeks he derives our Scyth and Scythian, and from its Latin form of *Scotus* our Scot. I have mentioned the meaning of the Arabic *Zaghath*, and may here state that it may possibly be the same word as the Hebrew *Succoth* as rendered in our Bible. However, be this as it may, it would appear that at a later period, among the Scythians themselves, as they branched off into independent nations, the name *Succothi* gradually underwent various modifications of form (as met with in books at least) the two most important of which, so far as concerns the subject before us just now, are *Sagatai* and *Gauthai*.

The first of these, *Sagatai*, which is an easy transition from the original *Succothi*, is the *Sakai* of the Greeks, the *Sacæ* of the Latins, the *Su* of the Chinese, the *Saka* of the Persians, the *Sakasuna* of the Hindus, and our own *Saxon*. Whilst the second, *Gauthai*, which is merely the first word *Sagatai* deprived of its initial sibilant, is the *Getai*, *Getæ*, *Yuchi*, *Jattah*, and *Jat* respectively of the before mentioned nations, and our own *Goth*.

With reference to the Saka or Sakasuna of the Hindus—the people by whom Budhism was introduced into India through their teacher Budha or Sakiya Muni—I would here observe that Dr. Moore, in his "Lost Tribes and the Saxons of the East and West," has given us full translations of some of the well known rock inscriptions of India of the Budhist period by a prior *transliteration* of the Arian letters into Hebrew.

So much for the name Skuthai, which is that by which the Greeks called the Scythians. Let us now consider the other name by which, as Herodotus tells us, the Scythians called themselves. I mean the word Scoloti, for though we are not immediately concerned to trace its etymology in connection with the subject just now engaging our attention, since the term applies more particularly to the European Scythians, still a brief reference to the word is necessary in this place the more clearly to elucidate what I have to say further on regarding the Scothi Israelites or Skuthai of the migration eastward.

The word *Scoloti* is, I think, the Greek form of an Israelite or Hebrew term signifying "the weighty," "the powerful," "the dominant," and derived from the Hebrew word which is rendered *shekel* in our Bible. In the Arabic dialect of that language this word, according to the modern system of transliteration, would be rendered *thacal* or *sacal*, and its derivative *thacaláti* or *sacaláti*, which in the plural form *sacalán* is frequently met with in Oriental literature (Musalman) as a term designating authorities of weight, importance, force, &c. Another derivative, *mithcál* or *miscál*, is the name of a well known weight in current use by jewellers, physicians, &c. throughout eastern countries. Of the appropriateness of this term as a national appellation of the Israelites who proceeded westwards from Media across the narrow passages of Euphrates we have the testimony of the prophet Esdras, who, in the

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passage before quoted, says "For the Most High then made signs for them," a special favour which enabled them to advance with an irresistable weight and force into the new countries of which they possessed themselves. We may therefore conclude that these Israelites adopted the name which the Greeks have rendered Scoloti by reason of the weight and power with which they established themselves in their new abodes. And this seems the more probable as the name is mostly confined to those Israelite peoples who went westwards into Europe and the adjoining regions of Asia Minor.

Well, this name Scoloti or Sacaláti, by the elision of the initial sibilant, becomes *Caláti;* whence the various forms Galati or Galatians, Celtœ or Celts, Galli or Gauls, &c.—the names by which the most powerful and important branches of the European Scythians are known. The word, in the form Calati, is also meet with as the name of a Scythian tribe anciently seated in the region about the upper sources of the Oxus, where the modern Galcha may possibly represent their descendants. Amongst the European branches of this people—the Calati—we also meet with the compound name Celto-Iberian or Celt-Iberian, that is Calati-Hebrews. The word Hebrew is generally considered to be derived from a verbal root of that language signifying "over," "across," "passage," &c., in reference to the passage across the Euphrates of Abraham the emigrant founder of the Hebrew nation.

In the Arabic language the root is *'abar*—"passage," "crossing over," &c., whence the European forms, such as Iber and Heber; whilst from its derivatives 'Ibarí and 'Ibráni come the European forms Iberia, Iberian, Hebrew, Hebraic, Hibernia, Hibernian, and the abbreviated forms Iere, Erse, Irish, Ierne, Erin, Ireland. I have brought these variations of form from the original name to your notice just now, because I shall have to point out in another passage presently later that the Israelites of the western migration, who were known by these names, are still represented in the Caucasus by the descendants of those of the Osean or Hoshean captivity under precisely similar names. The modern Ossetes, Ossi or Osián, as they are called by their neighbours and foreigners, knowing themselves as the Ir or Irán, and their country as Iránistán—in other words the Erse or Irish, and Erin or Ireland.

The accounts of the Scythians which have come down to us in the works of European writers, ancient and modern, are strangely contradictory, owing to entirely different peoples being spoken of under the same general national denomination. And thus it happens that whilst some accounts describe the Scythians as outer barbarians, of brutal habits and even cannibals; other accounts speak of them as a very powerful people, of polished manners, and governed by good laws. In other words there were Scythians and Scythians.

The best accounts we have of the ancient Scythians are given by Herodotus, who himself visited European Scythia—the country between the rivers Danube and Don—about 450 B. C. Out of the varied information he gives, I can select only a few statements which bear immediately upon the subject we are now considering. For though the name "Israel" is nowhere met with, yet we find some very remarkable evidence of the Scythians being of that people.

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For instance, Herodotus states that the Scythians, according to their own accounts, were the most recent of all nations, and that from the time of TARGITAUS, their first king, to the time of the invasion of their country by Darius was just one thousand years, neither more nor less. Now, as the expedition of Darius was about 507 B. C., the Scythian reckoning would carry them back to the time of Moses, who was the first national leader of the Israelites. But, apart from this coincidence, the Scythian account of their king *Targitaus*,—as the name appears in its Greek form—is very worthy of note. The name itself may be really a variant of *Sargetaus*,—"King of the Getœ,"—which in this case would be the title only, and not the real name of the Scythian king, and would then correspond to the Persian form Shah Jattah; or it may be that Sárgetaus is a purely Assyrian form like Sárdanapalus.

However, be this as it may, the Scythians, according to Herodotus, said that this *Targitaus* was a son of Jupiter and a daughter of the river Borysthenes. Whilst the Greeks, on their part, said that he was, one *Skuthes*, the son of Hercules and a woman half human and half serpent. Now, both these traditions evidently refer—as pointed out by Colonel Gawler,—to two well known events connected with the history of the Israelites, namely to the finding of Moses in the river Nile (Exodus II.) and to the brazen serpent held up in the wilderness of Sinai (Numbers XXI). The Greek reference to Hercules may be, perhaps, connected with the slaying of the Egyptian by Moses.

Again, Herodotus, speaking of the Scythian Getœ, says. "They believe in their immortality, and that there is no other God but their own. They think that they do not really die, but when they depart this life they go to *Zalmoxis*." He also states that the Greeks say that "*Zalmoxis* was a slave who acquired great riches, obtained his freedom, and then preached to his own people immortality." The name Zalmoxis is probably the Greek form of *Sármusá*—"King Moses,"—which may be meant for some Assyrian term corresponding with the Persian Shàh Músa. General Cunningham, however, explains the etymology (Archœological Survey of India. Vol. II.) as derived from the Hindi *Sapal* Persian *zhopál* or "club," which was the symbol of Hercules; the *Sapeleizes* of Indo-Scythian coins being taken by him to be the same word as *Gebeleizes* and *Zalmoxis*, and to signify "Lord of the Club."

However, another remarkable statement made by Herodotus regarding the Scythians is, in his own words.—"They never use swine. Nor, indeed, is it their wont to breed them in any part of their country." Now, without going further into the notices of the Scythian nations, which have been collated by different enquirers from the works of the ancient authors, I think the evidence here adduced is sufficient to show that some of them—the true Scythians at all events—derived their origin from the Israelites who escaped from their captivity in Media on the overthrow of the Assyrian power about 709 years B. C.

We know from history that in the spacious regions of Tatary the Scythians multiplied amazingly in numbers, and dividing off into numerous camps, or hordes, grew rapidly into powerful nations, which from time to time, burst out from the bounds of their native pasture

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steppes, and spread in great swarms of colonizing conquerors into the countries of Europe towards the west, and those of Asia Minor and India towards the south. That the Israelites in the direction of Tatary were also a multitudinous people we have the evidence of Josephus who states (Book XI, ch. 5.) that even in his time, the early part of the first century, "the Ten Tribes are beyond Euphrates till now, and are an immense multitude, and not to be estimated by numbers."

With the irresistible and all devouring floods of Scythian conquests in the direction of Europe we have now no concern, more than to draw attention to the fact,—one which is becoming more clear from day to day as our knowledge of the subject increases,—that almost every nation which has passed on to the west from this *Officina Gentium*, as the regions of Tatary have been aptly termed, has left its kindred and representatives amongst those which have passed to the South. Of the streams of Scythian invasion in this latter direction I shall have to make occasional mention by and bye, when I come to speak of some tribes which have been brought by them into Afghanistan.

Having thus briefly alluded to the supposed course and career of the migrating Israelites who proceeded northwards into Tatary—to the plains of the Oxus and the Jaxartes—let us now return to that band of them who stopped short at Ghor, and afterwards rose to the position of the dominant race in Afghanistan—the country to which they gave their name, and from which for awhile they weilded the sovereignty as kings of India.

At the period, then, that these fugitive Israelites—Pekahan Israelites, in contradistinction to the Osean Israelites, who, as we have seen, went westward across the narrow passages of Euphrates—took refuge in Ghor, the country now commonly called Hazarah, they were, according to the Afghan accounts, known by three different names. That is to say, they were collectively spoken of as *Bani Israil*, "Children of Israel;" as a nation they were called *Afghan*; and as a particular people they were distinguished by the name *Abdali* or by the term *Abdali* Afghan, that is, the Abdali people of the Afghan nation.

Their country is always spoken of as Ghor in the early accounts, and not as Hazarah till a much later period. At least I do not remember meeting with the name "Hazarah" in connection with the early period of Afghan history, and have always understood that it came into general use as a name for the country of Ghor, only after the time of Changiz Khan, as I shall explain later on.

Now the three names which I have just now mentioned, namely, Afghan, Abdali, and Hazarah, at once recall those which I asked you to bear in mind awhile ago when quoting 2 Kings, XV, 29; I mean the names Pekah, the king of Israel,—Naphtali, the tribe of Israel,—and Hazárah, the country of Israel. Let us consider each name separately.

And first that of the king Pekah. This word Pekah, may be taken, I think, as the true source of the name Afghan, or Apakhán as it is often written in current correspondence. And this on the assumption that the captive Israelites were commonly known to and distinguished by the Medes, into whose country they were transplanted, by the names of the

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kings who ruled over them at the time of the successive captivities. That is to say those of the Pekah captivity were called Pakhán or Pekahans—"the people of Pekah," and those of the Hoshea or Osea captivity were called Osián or Oseans—"the people of Osea."

The grammatical plural of Pekah is Pekahán—*vulgo* Pakhán or Pakán—which would mean those "belonging to Pekah," or, as we should say, the Pekahans or Pekahites. In the spoken dialects this plural word Pakan or Pakhan would be Apakán or Afghan, just as we see exemplified in the traditional derivation, by the Afghans themselves, of their national name from the Persian word *afghan* or *fighan* which means "complaint, lamentation, wailing," &c.

Now this word *fighan* itself suggests a very important fact, namely, the existence, in a Persian form, of the forgotten and unrecognized original Pekahán or Pakhan. This supposition is supported by the fact that the Arabic form of Pakhan would be Fighán, for there is no letter *p* in the alphabet of that language; as well as by the fact that our first knowledge of the Afghans, by that name, comes to us through the early Arab writers. Thus the colloquial form would be Afghan, plural Afághina. In corroboration of this view of the derivation of the name Afghan from the word Pakhan or Fighan, I may here state that in native lexicons (the Farhangi Násiri, the Burhani Cáti', &c.) the word *afghán*, besides its Persian meanings before mentioned, is described as the name of a people who having come out from the nation of the Israelites settled as a separate nationality in the countries towards India, in the Khybar, and the adjacent mountainous region.

Tne Farhangi Nasiri says of the word *afghán*—"A people originally from Misr (Egypt) who in the course of time having separated from the Bani Israil found their way to Hindustan and there in the mountains built the fort of Khybar, and gradually attained to the sovereignty of Hindustan. One tribe (*tayifa*) of them having increased, their chiefs are now rulers of Afghanistan."

I have often seen the word Afghan written Apakhan and Apakan in both Persian and Pukhto correspondence and have also heard it pronounced in the same way, especially amongst the hill tribes. In books one meets with the term Bani Afghan for the Afghan people as a whole. Bani Afghan would then mean "the descendants of the Afghan or the descendants of the people of Pekah"—whilst Afghan or Apakhan alone would mean "the people of Pekah." Anglice Pekahans, Pekahites.

This Pekah, you will remember, was king of the Israelites who were carried away into captivity by Tiglath Pileser. And these Israelites, the Pekahan Israelites, were those who, as I have before described, in their flight from Media took the route eastward to Ghor, the modern Hazarah; whilst those of the subsequent captivity, by Salmanasar, when Hoshea or Osea was king of Israel, the Osean Israelites, went westward across the narrow passages of Euphrates. The Israelites of both the Pekahan and the Osean captivities, you will also remember, were successively planted in the same localities—namely in the country of the river Gozan and in the cities of the Medes.

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Now there is no objection to the assumption—on the contrary it is a very natural one—that these Israelites, whilst in bondage in Media as despised strangers, may have been commonly called by the people of the country after the names of the kings who were their rulers at the time of their respective captivities, and against whom the Assyrian sovereigns waged war; for those are the names which would be in the ears and mouths of the people. In this case the people of Media would naturally call those Israelites of the Pekah captivity Pekahan, and those of the Osea captivity Osean. And this more especially to distinguish those of the first captivity from those of the second, which occurred twenty years later; both sets of captives being planted in the same localities.

Or possibly, if not more probably, the terms Pekahan and Osean originated with the Israelites themselves to distinguish those of the one captivity from those of the other; for although both parties were brought together in their adversity into one locality, their previous separation for twenty years was long enough to estrange the two companies by the growth of different and perhaps antagonistic interests, as is suggested by their subsequent action on the overthrow of the authority of their task masters—the Israelites of the Osean captivity having escaped bodily westward and those of the Pekahan captivity bodily eastward.

In either case we can understand that these names were actually employed to distinguish the people of the two distinct captivities respectively, and that in time they came to be the national appellation by which these distinct bodies of Israelites were known, both amongst themselves and amongst the heathen peoples in the midst of whom their lot was cast. And if this was so, then we can also easily understand how the name Afghan came to be the national appellation of the Pekahan Israelites, or at least of that portion of them who shortly afterwards settled in Ghor, and remained in the region or country where the name had acquired currency and a well recognized signification. That the two sets of Israelites of the successive captivities by Tiglath Pileser and Shalmaneser were distinguished by the names of their respective kings, has been assumed not only as a natural circumstance, but because it seems to be supported by the fact of the existence at the present day of two different people as to location, who by their national appellations, and territorial situation in respect to the country of their captivity, appear to be referrible for their origin to the Israelites of the Pekahan and Osean captivities respectively. Namely, the Afghan south-eastward in Ghor as the representative of the Pekahan, and the Ossian north-westward in Caucasus as the representative of the Osean.

Added to the evidence derived from their names and localities, there is such a striking similarity in the peculiar customs, manners, character, and, to some extent, traditions of these two peoples that it is difficult to avoid the conviction that a very close and intimate relationship existed between them at some long passed period of antiquity. In support of this view regarding the survival of the ancient Israelite name Pekhan in that of the modern Israelite Afghan I may mention as a very curious coincidence

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the actual existence of the people called Osian, Ossian, or Ossetes amongst the mountaineers of the Caucasus to the north of the modern Georgians. Whether they claim to be Bani Israil or not my information does not enable me to say. But if their traditions should connect them with the Israelites of the captivity when Hoshea or Osea was king—with the Osean Israelites—then we should have descendants of the Lost Tribes of Israel now found upon the very borders of the country into which we know they were carried away captive, and by names, too, corresponding with those of the different Israelite migrations in their respective directions. That is to say, the Osian to the northwest in the direction taken by the Israelites of the Osean captivity, and the Afghan to the southeast in the direction taken by the Israelites of the Pekahan captivity.

In this connection I may here state that, according to the account given of the modern Ossetes by Baron Von Haxthausen in his "Transcaucasia," published in London in 1854, there are some remarkable evidences unwittingly produced of their being of Israelitish descent. He says in effect that the Ossetes, who are neighbours of the Georgians, differ in manners and customs from all the other tribes of the Caucasus, though "they have possessed their present territory from an early date, since the Georgian annals mention them as their neighbours so long ago as the time of Alexander the Great," and assert that they came from the banks of the Don. This is corroborated by Ptolemy who mentions a people of the same name as living at the mouth of that river. The assertion shows, at least, that the Ossetes of the Don and the Caucasus were one and the same people.

Ossites or Ossetians is the name by which they are called by Europeans. The name by which they call themselves is Ir or Iron, and their country Ironistan. By the Circassians they are called Kash'ha; by the Tatars, Oss and Tauli; by the Lesghis, Otz and Otze; and by the Georgians, Ossi. The Persian plural of this last form would be Ossian. So that, whilst known to foreigners by the name of the king under whose reign the Israelites of the second captivity were carried away—that is Oseans—they were known amongst themselves by the name of the nation to which those Israelites belonged—that is the Hebrew, Hibernian, Iberian, Ierian, Erse, Irish, Ir, Iron.

The majority of the Ossetes are now nominally Christians of the Greek Church, Christianity having been introduced among them about A. D. 1171 to 1198 by Queen Thamara, to whom is attributed the erection of most of the churches and monasteries—now generally neglected and in ruins, though venerated as places of pilgrimage. Some Ossetes dwelling on the Circassian frontier are Muhammadans; but neither religion has made much impression on them, and, as the author from whom I quote says "they are in fact semi-pagans, indeed some are wholly and avowedly heathens. They offer sacrifices of bread and flesh upon altars in sacred groves; of these the most famous is in the interior of the country not far from the village of Lamadon; it was originated by the Nards, an extinct tribe, supposed to have been Jews. The cave of the prophet Elijah (Asilja leget), the guardian and patron of the Ossetes, is in this grove. * * * * The Christian Ossetes likewise

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frequently present sacrifices and thank-offerings, consisting chiefly of flesh, fish, and bread, on ancient altars in caves and sacred groves, and sometimes on large artificial mounds of stones. Before the caves of Elijah (for there are several, that which I have just mentioned being the most celebrated) goats are slain and their skins hung upon lofty trees."

In their marriage customs, laws of hospitality, blood feuds and retaliatory observances; in their pride of birth, reverence for the graves of their ancestors, and respect for their elders; in their martial spirit, predatory habits, and contempt for industrial labour; in their superstition, their fondness of pilgrimages to sacred shrines, and their belief in witches, magicians and fortune tellers, the Ossetes or Ossians bear such a striking resemblance to the Afghans that it is difficult to avoid the conviction that the two peoples were at some time united, or at least owned a common nationality, if not a common ancestry.

The language spoken by the Ossetes belongs to the Indo-Germanic stem; and is more nearly allied to the Persian than to the German. It has no prepositions. Lastly as our author says. "The physiognomy, figure, and whole outward appearance of the Ossetes form a perfect contrast to the surrounding Caucasian tribes, especially the Georgian * * * * The Ossetes are short and thick set being rarely above five feet four inches in height, and have broad haggard features, usually blue eyes, and red or light brown hair. The women are seldom pretty; they are short, stoutly built, and mostly flat nosed." The Ossetes have adopted the Circassian dress, "They are however very clean, wearing their hair short and cut quite round; they also shave off the beard, but many have moustaches." Our author considers the Ossetes to be "clearly the same people as the Alani," and the conviction was forced upon him "that there must have existed in very early times, a close relationship between the Ossetes and the ancient Germans."

To me it appears that the relationship was closer between the Ossetes and Afghans of that early time—between the Osean Israelites and the Pekahan Israelites—whose modern representatives I take them respectively to be.

However this may be, let us turn our attention to the people more particularly claiming our notice just now.

Now if we accept this derivation of the name Afghan from Pekah, king of Israel, as I have ventured to suggest, then we must admit that in their national name we have a direct proof of the Israelitish descent of the Afghans. And this evidence receives confirmation from the other name by which the Afghans more particularly call themselves. I mean the name Abdali.

This name is properly more a tribal than a national appellation, and though sometimes used to designate the Afghans generally, is strictly applicable only to those Afghan tribes which are now located in and about Kandahar and the country towards Herat, and which are spoken of as Abdali Afghan, or "the Abdali tribes of the Afghans."

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The name Abdali has been generally considered to be derived from that of a tribe of the White Hun, which came to be known to European writers as the Nephthali or Ephthali, the Hiatali or Hayathali, after the name of a famous general under whom they revolted from their sovereign, towards the close of the fifth century of our era. As I shall refer to this subject again later on, I will now only remark that we have no clue as to the exact time when the name Abdali came to be used as an appellation of the Afghan people. For we only hear of the Afghans for the first time simultaneously with the appearance of Muhammad, towards the second quarter of the seventh century, or about a hundred and twenty five years later than the revolt of the Nephthali or Ephthali Hun.

It is quite possible that these Ephthali Hun may have failed to maintain their independence,—although the number of the revolting army is stated at 100,000 men,—and that they may have become incorporated with the Afghans, and thus given rise to the term Abdali Afghan. Especially as they are said to have proceeded westward after their revolt in Sogdiana, a course which would have brought them to the vicinity of Herat, which in their early time here was a principal seat of the Afghans. Whilst their reception of the name Afghan would indicate an acknowledged affinity of race, of which we find no other instance in the whole range of the heterogeneous peoples composing the confederacy of the modern Afghan nationality.

On the other hand it is equally possible, and I think more probable, that Abdali may in reality be the original name of one of the tribes of the Israelites whose flight from Media to Ghor we have already traced; and that it may have acquired pre-eminence amongst the other Afghan tribes—by which I mean the other Israelites who found refuge in Ghor along with them under the comprehensive name of Afghan—either on account of its original importance in the home country before the captivity, or else on account of some other circumstance which may have brought it into prominence as the leading tribe in their new settlement in Ghor.

But, be this as it may, the point to which I would now invite your attention is the name Naphtali in the text before quoted from—2 Kings, ch. XV, v. 29. I will repeat the verse. "In the days of Pekah, king of Israel, came Tiglath Pileser, king of Assyria, and took Ijon, and Abel-beth-maachah, and Janoah, and Kedesh, and Hazor, and Gilead, and Galilee, all the land of Naphtali, and carried them captive to Assyria." That is to say, all these places were in the land of Naphtali, and of the tribe of Naphtali. We may, therefore, take it as most probable, if not indeed quite certain, that Naphtali was the name by which these Pekahan Israelites knew themselves, and by which they were distinguished from the other Israelites of this captivity, the subjects of king Pekah, who dwelt amongst and around them in the land of Naphtali, and whose names are mentioned in the text before quoted from 1 Chron. ch. V. v. 26.

And thus we can understand the survival of the name of Naphtáli, under the modern form of Abdálí, as a tribal appellation, with the later name of Afghan as that of the people of Pekah generally, who

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were carried into captivity. For on comparing the two names we are at once struck with the identity of Naphtali, the tribal name of the Pekahan Israelites, with Abdali the tribal name of the Afghan Bani Israil.

This view of the identity of the Afghan Abdali with the Pekahan Naphtali, need not of necessity militate against the other view of their identity with the white Hun Ephthali. Because the Huns themselves sprung from the Scythians, who, we have already seen, derived their origin from the *Succothi* Israelites, the early companions in flight of their brethren who stopped short at Ghor under the names of Bani Israil, Abdali, and Afghan. Further, because the name of the Israelite Naphtali, in the form of Ephthali, may also have survived amongst the white Hun, and possibly been the proper name of the revolted tribe known as the Nephthali or Ephthali. Now, if we accept this identity, which I have suggested, of the Abdali tribe Afghans with the Naphtali tribe of Pekahans, then we must admit another direct proof of the Israelitish descent of the Afghans.

In confirmation again of this position, we have the indirect evidence of the name of the country in which the Afghans settled after their escape from the captivity in Media. And this brings us to the consideration of the last of the three names to which I have invited your special attention. I mean the name Hazor.

Now with regard to the name of the place in Israel called Hazor in the text before quoted,—the name of a chief city and of a district in the land of Naphtali—I think we may take it to be identically the same word as the modern Hazarah, which is another, and now the most commonly used name of the country of Ghor;—that Ghor to which, as we have seen, the Afghan Bani Israil fled for refuge on escaping from their captivity in Media.

It may have been that the Hazor in Samaria was the most populous and important place of the Naphtali Israelites. Or it may be that it was a place endeared in their recollection by the fertility of its soil and the delights of its climate; by the fruitfulness of its vineyards and the beauty of its mountains. Or, may be, its memory was kept alive in their minds by happy associations of the place with the period of their freedom and prosperity in the old country. In either case it would be natural that the Naphtali Pekahans—our Abdali Afghans—on recovering their freedom and acquiring possession of a new country, should name it after some place, some favourite place, in the home country; or, perhaps, after the place there which was the residence of the leaders of their company here. And thus we may understand how the name of Hazarah—the Hazor of the land of Naphtali in Samaria—came to be given by the Afghans to the new country of their adoption, and which was known to them at first by its native name of Ghor.

I have stated before that the name of Hazarah is not met with in the early period of the settlement of the Afghans in its territory, but that the native Arian name of Ghor is always used. This I think is to be accounted for by the explanation that the latter was an established and recognized name; whilst the other would only be used amongst

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and understood by the Afghans themselves. The more especially as at that period they were an insignificant and little known people; and had certainly not attained to the prominent position which we find that they occupied at the time when the name of Hazarah came into general use as that of their country.

It is uncertain when the name Hazarah came into general use, but it would appear that it did not supersede the native name of Ghor till after the invasion of Changiz Khan, when, according to the generally accepted account, that country was called Hazarah by the Persians after the "thousands," or military divisions under which it was held by the army of the Mongol conqueror.

This derivation of the name from the Persian *hazár*, "thousand," seems to be confirmed by the circumstance that other districts which were at that time held by the Mongol troops for a brief period are also now called Hazrah or Hazarah;—such as the Hazarah on the east bank of the Indus above Attock (our Abbottabad District), and the Hazrah on the western spurs of Sufed Koh, a district which is an important military position, as it commands both the Kuram and Khybar routes to Kabul from this side, and which is now in the possession of the Ghilzi.

On the other hand, it is just as likely, and I think much more probable, that these names have really nothing to do with the Persian word for thousands, but that they have actually originated from the circumstance of their occupation by Afghans—emigrants from the true Hazarah or Ghor. For in the case of the Indus Hazarah the inhabitants are of acknowledged Afghan descent; and it is most probable that the Sufed Koh Hazrah was also occupied by Afghans previous to the encroachment of the Ghilzi.

On the whole, it would seem much more probable that the name Hazarah was that always used by the Afghans themselves as the appellation of their new country; but that it came into general use and notoriety, only when the Afghans themselves, after the invasion of Changiz Khan, rose to fame as a powerful military nation. For we must remember that it was by the Afghan arms that the native Princes of Ghor were first raised to the dignity of a sovereign dynasty. And that it was by the Afghans that that Ghori dynasty was afterwards overthrown and supplanted, when their leaders assumed the sovereignty, not only in Ghor but in India also; where their kings ruled from the close of the thirteenth to the early part of the sixteenth centuries, when they gave place to the Mughal Emperors.

I think, then, that we may fairly assume that the Hazárah of Ghor was the name given to that country by the Abdali Afghan in commemoration of the Hazor in the land of Naphtali—the tribe of their immediate ancestors,—and which may, indeed must, have been the actual birth place of many of their company on their first arrival in the refuge of the mountain fastnesses of Ghor. For from the time of their being carried away into captivity from Hazor in the land of Naphtali to their settlement in the Hazárah of Ghor was a period of little more than thirty years. We may, I think, further fairly assume that

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the name Hazarah, as the appellation of their new country, was currently used only amongst the Afghans themselves. So that the Israelitish name of the country was unknown outside its bounds, till the accident of sovereignty brought it into notoriety with the fame of the people to whom the name belongs. And thus led to its superseding the native Arian appellation—Ghor.

If now, we accept this explanation, which I have ventured to offer, of the derivation of the name of the Hazarah of the Afghan Abdali country from the Hazor of the Pekahan Naphtali country, then we must admit the actual identity of the two names, and a third direct proof of the Israelitish descent of the Afghans.

But, apart from the evidence afforded by the Scriptural names of the king, the tribe, and the territory of Israel, which I have thus attempted to identify with the current names—national, tribal, and territorial, of the Afghan, we have numerous other old Israelite names of families still existing amongst the true Afghan tribes of the present day. Many of these, I admit, are not peculiar to the Afghan, being shared by him in common with other Muhammadan people. But at the same time I claim for the Afghan a greater, if not an exceptional, use of old Israelite names—such as Uriah, Israel, Zachariah (Zakaria), Jehu (Yahya), Asaph, Barak, Barachiah (Barakia), &c., than any other people of the Muhammadan religion.

For instance, in 1 Chronicles ch. VIII, v. 33 we read "And Ner begat Kish, and Kish begat Saul." The last two, under the native forms of Kais and Sarul, are the very names of the original Afghan progenitors; whilst amongst the grandees of their Israelite brethren when in the land of Palestine, as recorded in their traditions, we find such names as Barakiah (Barachiah), Iramiah (Jeremiah), Asaf (Asoph), Afghanah, &c. In the 39th verse of the same chapter we find the name Eshak as that of a son of Saul; and we find also an Afghan tribe at the present day named Achakzi, the descendents of Achak. Again in Chronicles, ch V, v. 6, we find that Beerah, Prince of the Reubenites, was amongst those carried into captivity by Tiglath Pileser; and we find now one of the principal Afghan tribes named Barehchi, "those belonging to Bareh." In the following chapter, amongst many other names, we find those of Amazia, Hilkiah, and Bani; and we have at the present day Afghan tribes called Amazai, Halikozai, and Bani; together with others named Ashezi (plural of Ashezai), Gadazi, and Razar, corresponding to Asher, Gad, and Rezia. Asher and Rezia are mentioned in the seventh chapter as of the children of Joseph, son of Israel, who dwelt in the towns on the borders of Manasseh; and by a curious coincidence the tribes of Ashezai and Razar are now divisions of the great Yusufzi, (descendants of Joseph) tribe. The examples which I have now mentioned are only a few which occur to my mind, out of many others which could be produced by an examination of the Afghan genealogical lists.

Again in the same chapter (1 Chron. VII.) we find one division of the tribe of Issachar (we have seen before that, according to Jacob ben Israel as quoted by Maimonides, Zacchar settled in Afghanistan) named Tola, which in the days of David numbered 22,600 fighting men; and in

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Ghor we find one of its strongest forts in the time of Changiz Khan, the seige of which is described in the Tabacati Nasiri (a book in which the residence of Israelites in Ghor in the time of the Shansabi dynasty is clearly stated) named Tolak.

Once more again, we know that the Israelite city in which was kept the Ark of the Covenant, and to which the people went up to perform their religious observances, was called Gilgal; and we find now that the site of the great idol city at Bamian is called Galgala. The name of the Israelite capital in Palestine was Samaria; and in the country to which we have traced the Succothi Israelites, after their escape from captivity in Media, we find the capital city called Samarkand—that is, the city of Samara. I have before mentioned the Israelite districts of Kabul, Zebulon and Hazor in Samaria, and may now state that, in the time of the Afghans as a sovereign people—the thirteenth to the sixteenth centuries—the principal divisions of the country now called Afghanistan were called Kabul, Zabul (singular of Zebulon), and Hazarah.

But besides these few examples of extraordinary coincidence in the names found among the Israelites in Samaria and the Bani Israil in Afghanistan, we have other confirmatory evidence in the well known Israelitish customs of the Afghan people. I have not time to enter upon this subject now, and will not therefore tresspass on your patience with its details, especially as I have other matters, not so well known, to bring to your notice.

By some much stress has been laid upon the Jewish physiognomy of the Afghan people as a proof of their Israelite descent. It is certainly a very striking feature, particularly amongst the noble families, and may be taken to swell the list of evidences. But to my mind the strongest evidence of the Israelite descent of the Afghans is the simple fact of their calling themselves Bani Israil, a claim which is otherwise unaccountable. With them the belief in their Israelite lineage is very strong and has survived with their traditions from the time of the captivity through the vicissitudes of upwards of two thousand five hundred years.

Now the evidence I have advanced in the support of the Afghan claim to be Bani Israil is neither slight nor unimportant. To my mind it carries conviction of their right to that glorious title and proud descent.

But granting all this—if you will—it still falls short of a precise answer to the question with which we started—Are the Afghans Israelites? For that question itself naturally proposes another, namely, who are the Afghans? Why, Israelites of course some will say. Precisely so. But that is not my meaning in making the enquiry; I mean—Who are the Afghans amongst the various people which compose the modern Afghan nationality. For the name as now commonly applied is, in a loose way, made to include all the inhabitants of Afghanistan. In this sense indeed the term is of such indefinite meaning that really it is difficult to say who's who in that—well, at the risk of offending our warriors—that blessed country.

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But to follow out this enquiry would take up as much time as I have already occupied, for I have now got through only half my paper, whilst the allotted hour, and I fear your patience, have fully run out. To those who have come here expecting a political dissertation on the Afghan Question, my subject, I fear, has proved a disappointment. If so I would claim their indulgence as the rules of this Institution debar the consideration of that aspect of the question.

PART II.

I concluded the first part of my lecture on the enquiry "Are the Afghans Israelites?" with the query "Who are the Afghans?," and remarked that this question naturally suggested itself, owing to the loose way in which the name "Afghan" was commonly applied to the inhabitants of Afghanistan—in a sense so indefinite indeed, that it is nowadays difficult to say who's who in that delectable country.

It becomes necessary, therefore, before attempting to solve the question, Who are the Afghans?, that we first define the proper application of the name itself. And this is by no means an easy matter, for, according to the Afghans themselves, their patronymic, whilst strictly belonging only to the Abdali and kindred tribes of Afghans—which since the establishment of the modern Afghan kingdom in the middle of the last century by Ahmad Shah, Abdali, have been distinguished by the name Durrani—is held applicable to all those Pukhto speaking peoples whose descent is recorded in their genealogical tables; whereas most of the tribes so included claim for themselves a lineage distinct from the Afghan.

These genealogical tables, as before stated, were probably compiled in their present form only in the fourteenth century, and are not therefore reliable guides to the early composition of the Afghan nation. They are, nevertheless, not without some value by reason of the significant names which appear in the lists. In these tables, strangely enough, all the different tribes of the present Afghan nationality are classed together in the three great divisions of Sarabanr, Batan, and Ghurghusht, as the descendants of a comparatively modern common ancestor, who is called Kish or Kais, and who is stated to have been the leader of the first band of Afghan converts to *Islam*—about twelve and a half centuries, or 1258 years ago.

In a little book—"The Races of Afghanistan"—which I published a few months ago through Messrs. Thacker, Spink, and Co., Calcutta, not with the object of putting forward an ethnological treatise on that subject, but with the special and pressing purpose of drawing attention to the heterogeneous composition of the Afghan nation, and the impossibility of its discordant elements spontaneously uniting to govern themselves under any native Ruler who was not appointed, guided, and supported by a Paramount Power, and that only short of direct annexation and administration by a foreign Paramount Power, I have briefly alluded to the tribal classification of the Afghan tribes according to their own accounts, and have also noticed separately the several

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distinct peoples who form the principal elements of the existent Afghan nationality. I will not, therefore, dwell on this subject now, but pass on to enquire what peoples composed the inhabitants of the present Afghanistan at the time of the first arrival of the Israelites in that part of its territory called Ghor, and what peoples have come into the country subsequently to that period. We shall then be able to say who are not the Afghans, and perhaps find an answer to the question "Who are the Afghans?"—

But here I must confess that I shall be groping much in the dark between the lights of already well known and recognized tribes and the shadows of the others still in obscurity and unidentified. And this is owing, partly to the fact of the complete incorporation and absorption of some tribes of ancient peoples into the dominant Afghan race; partly to the inextricable confusion of names in the genealogical lists, by reason of the adoption of strange tribes into the Afghan nationality; and partly to their later uniform assimilation under a Muhammadan nomenclature; but mostly owing to the want of historical data, and the absence of means of reference to ancient authorities. This last indeed is a very serious difficulty, for the run of a good classical library would, I am sure, soon clear up many points of doubt and obscurity which still beset the interesting and important subject of the ancient history of the peoples and territories of the modern kingdom of Afghanistan. In the face of these difficulties, and the absence of these aids, we must be content to guide our course by the lights before us.

We learn from what has been published of the sacred books of the Parsis and the Hindus that, at the time when the Afghans are supposed to have first arrived in Ghor—about 709 B.C.—the country, now known as Afghanistan, was inhabited by an Arian people, who were partly Persian and partly Indian—Persian in the western parts of the country, where the language was moulded on a Persian model; and Indian in the eastern parts, where the language was moulded on an Indian model—and that these Arian peoples had either dispossessed and absorbed, or had reduced to a state of subjection and servility, the previous inhabitants of the Turanian or Tatar race; or else they had shut them off in the inhospitable mountain fastnesses into which they had driven them, and maintained with them no relations except of a hostile nature.

We learn also from the statements of the ancient Greek and Latin authors, as well as from the Chinese Annals, that these Arian peoples were in turn—during a long series of centuries—invaded by colonizing migrations of successive Scythian hordes coming from the north country about and beyond the Oxus; and all of them subsequent in date to the arrival of the Afghans, or Pekahan Israelites, in Ghor.

We thus have ample evidence of a great commingling of peoples of diverse races within the area of the present Afghanistan to explain the manifestly heterogeneous—and to no small extent incongruous—composition of its modern Afghan nationality. But the difficulty is—in the absence of details and references—to recognize and identify its component elements with the different peoples, who, we are told, have from time to time come and settled in the country.

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The "Report on the Ethnology of the Punjab," in Vol. II. of General Cunningham's "Archæological Survey of India," throws some rays of light upon the adjoining country to the west, and has done something to clear away the obscurity which surrounds this subject. But there is still a great deal to learn and to discover about the peoples of Afghanistan.

Of the earliest inhabitants of the land some traces doubtless exist in the tribal and local names of the present day, and perhaps even their descendants constitute some of the obscurer tribes which are now found amongst the general population of the country.

For instance in the name of *Takinabad*—which is the site of an ancient city near the river Helmand in the Kandahar district—we may have a relic of the early Turanian occupants, the *Tak* or *Taka*, whose principal seat was more to the eastward, in the valley of the Indus and the northern Punjab—where the great and populous city *Takshasila* or *Taxila* was their capital; and where the modern names of *Tank*, *Bannu Tak*, *Takal*, *Attak*, (Al Tak), &c., testify to the sites of former Tak or Taka settlements. Whilst in the petty tribes of *Taka*-ghar and *Taka*-barg, now dwelling amongst the Hazarah Mongols, we may have the actual descendants of the early Turanian Taka, probably the aboriginal inhabitants of the country.

Again, in the *Mand* and *Zamand* of the Afghan geneaolgies—for the tribes no longer exist as such—we may have the names of another early Turanian people, namely the *Med* or *Mand* of the Arabian writers. Their seat in Afghanistan was in the valley of the *Helmand*—the *Etymandrus* of the Greeks—and possibly the river derived its name from that people. Their name re-appears in later centuries among the Scythian tribes, and also among those of the Indian Arians, under forms very slightly altered from the original, notwithstanding the complete absorption of the people into those foreign nationalities, as will be noticed later on.

With these early Turanians we may perhaps include the *Damar* tribe, now located among the Kakar Pathans. They are probably the same people as the *Damara*, who are mentioned in the "Raja taringini" as one of the most fierce and intractable of the ancient inhabitants of Kashmir. By some the modern *Dom* or *Dum*—who are now mostly employed in the Punjab as village watchmen and police informers—are considered to belong to this people. The *Damar*, *Damara*, or *Dum* were probably, in early times spread all over the hills of the Suleman range as far north as the frontiers of Kashmir. They are still found more or less widely scattered all over this region, mostly in isolated families. But in Afghanistan at the present day they constitute a small community of predatory and barbarous savages, who hold the hills to the north east of Quetta, and are quite a distinct people from the other barbarians amongst whom they dwell.

Their ancient neighbours here, the *Nagha* or *Naga* of the Afghan genealogies, may perhaps be a relic of another well known and very widely spread early Turanian people.

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The *Kharoti* also, who are now found further north on the Suleman range—and whom I take to be the modern representatives of the *Arachôti* of Alexander's time—may possibly belong to this category. For they certainly are not Afghan by descent, nor indeed do they at all pretend to be so. Neither are they Ghilzi, amongst whose tribes they are now commonly reckoned. Their features and general appearance stamp them as a distinct people from those amongst whom they dwell, and in their type relegate them to the Turanian race.

There are probably some other remnants of the early Turanian population to be found amongst the obscurer tribes of the country. But the main portion of the inhabitants at that time—the time of the arrival of the Afghans—was undoubtedly of the Arian race, and from them the country derived its ancient name of *Aria-vartha*—the Ariana of the Greeks. These Arians comprised the peoples of very distinct migrations, both on the side of Persia, and that of India.

Of the Persian Arians—who, it seems, mostly occupied the western and northern parts of the territory—the modern representatives are found in the *Tajik*, or Persian population of the country; such as the *Dihi*, *Dihwar*, or *Dihgan*, as they are called in different parts thereof. The names mean simply "villager" or "rustic," and the people themselves are scattered all over its area as agricultural labourers. But in some parts of the country—as in the valleys at the Southern base of Hindu Kush,—they constitute distinct village communities, and maintain a limited independence. Besides these there are the early Arians of the independent little States in the inaccessible valleys about the sources of the river Oxus, namely, the Badakhshi, the Wakhi, the Shughni, and the Roshani. The last is famous for having given Alexander the Great his Bactrian wife—the beautiful Roshana; and all are celebrated as owning chiefs and families who claim descent from the Macedonian hero and his companions.

Towards the west of the country were the ancient ARII, now represented by the *Haravi* or *Herati*, and the SARANGÆ or DRANGÆ whose modern representatives are found in the *Zarangi* section of the inhabitants of Sistan of to-day. With these early Arians may also perhaps be included the Jamshedi and Firozkohi of the present Ghor country.

These Tajik peoples for the most part hold a very subordinate position amongst the general population of the country, and are mainly employed as agricultural labourers, gardeners and handicraftsmen, hucksters and petty shop-keepers; also as clerks, secretaries, bankers, physicians, merchants, &c.

All these Persian Arians have uniformly maintained their national individuality quite distinct, not only from the Indian Arians, but also from the Afghans. They speak different dialects of the Persian tongue, and though now all professedly Musalmans, of either the Sunni or the Shia sects, they observe their own national customs, manners, and dress. They are never called either Afghan or Pathan, but are distinguished by the national appellation TAJIK—a term which is said to have first come into use during the time of the Arab invasion. By some the root

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of the word, namely *Taz* or *Taj*, is supposed to be the Arabic name for Persia or the Persians; by others it is supposed to be the Persian name for the Arabs naturalized in their country. The *Taochi* of the Chinese Annals is supposed to refer to this *Tajik* people, who form an important portion not only of the population of Afghanistan, but also of the settled population in the cities and villages both of eastern and western Turkistan, where they are also known by the name of *Sart*, in common with the settled population generally as distinct from the nomade.

We now come to the Indian Arians of Afghanistan, to the Pathan proper—the modern representatives of the ancient Rajputs—the Kshatriya or Thakur caste. With them, perhaps, are included some of the Brahman and Khatri (or Banniya) castes, for they were, apparently, the most numerous and important element of the population of Southern and eastern Afghanistan as late as the eighth century, when that region was invaded by the Arabs.

The Indian Arians are still found for the most part in eastern and southern Afghanistan, where they constitute the original true *Pukhtun* or Pathan nationality, which now includes many naturalized tribes of foreign origin.

Of the early populations of this people, we have the modern representatives of the native GANDHARI—the *Gandarii* or *Gandaridæ* of the Greek—in the natives of the Peshawar valley—*Hindki*, as they are now called—and of the adjoining mountainous country to the northward, between the Indus and Kabul rivers, inclusive of Kafiristan.

According to the Hindu accounts the *Gandhari* were settled in this region as early as the period of the *Mahabharata*—"the Great Bharat War"—upwards of fourteen centuries (1426) B. C.; and there is reason to believe that these *Gandhari* extended much further than the limits of the GANDHARA province; namely, to the north as far as Bactria and Sogdia, and to the west as far as the Helmand river; and in both directions with other cognate tribes of the *Yadava* or *Jadubansi* race.

Of these cognate tribes, the BHATI Arians (who anciently, it is supposed, occupied the Ghazni and Kandahar districts), are now probably represented by the *Bati* or *Batani* Pathans. They, together with the ancient *Gandhari* of the Helmand valley, are now incorporated with the Afghan tribes of the great *Sarabanr* and *Batan* divisions, and so intimately are they now mixed up with the genuine Afghan, that they are beyond recognition, except by some of the earlier names in the genealogical lists, and the present names of some of their clans.

From these, it would appear that, the Afghan, on moving out of Ghor, or Hazarah, and spreading over the lower Helmand valley as the dominant race, mixed with and completely absorbed these Indian Arian tribes, and with them became one brotherhood in the bonds of a common Islam. We must, therefore, now look on them as Afghan, since they have lost all trace of their original nationality and have merged their individuality in that of the Afghan, except only in the essential particular of language, which they have engrafted upon the people by whom they have been absorbed.

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Most of these tribes of naturalized Afghans, those of the *Batani* division particularly, are now settled in different parts of India, having migrated thither with the various military expeditions of the Muhammadan armies from Afghanistan.

In the little book before mentioned I have referred to that great migration of the Gandhari people from the Indus at Peshawar to the Helmand at Kandahar, and also to their counter migration from the country on the Helmand—the *Kandhar* to which they transplanted the name of their fatherland—back again to the old home on the Indus.

The return migration took place after a lapse of eight centuries—probably much in the same fashion as in recent times we have seen a whole Tater horde migrate from their settlements on the Volga back again to their pristine home in the steppes of Tatary—when the returning emigrants were no longer the mild and peace-loving Budhist Gandhari of the out-going colony, but the fierce and fanatic Musalmans of the newly formed Afghan nationality. The return migration seems to have been as powerful and numerous as the outward-bound one, and comprised the *Yusufzi* or *Asapzi* tribe with its *Mali* and *Mandanr* divisions, and the *Mahmand*, the *Ghori* or *Ghoriya khel*, and the *Khakhi* or *Khashi* tribes of the Sarabanr Afghans.

Of these tribes, the *Mandanr* and the *Mahmand* represent, very probably, the *Med* or *Mand* previously mentioned and again to be referred to in a later passage; whilst the *Ghori* and *Khashi* are evidently territorial names, and indicate the locality whence those tribes originally came, namely, from Ghor and from Khash to the west of the Helmand. The Yusufzi or Asapzi, as a whole, probably represent the Gandhari who became naturalized Afghans, as it would seem that the *Aspii* mentioned by Arrian were certainly a tribe of this people—the *Gandhari*.

In my lecture in this room last year, on "Kafiristan and the Kafir," I briefly described how these tribes took possession of their fatherland by forcibly ousting their yet idolatrous kindred of the parent stock, and driving them into the hills of Kafiristan. And I stated that a remnant of the ancient *Gandhari* still existed under the old name in the mountainous parts of of their native home—the original *Gandhara*—where they were now coupled in the brotherhood of Islam with another tribe called *Safi*. I mention this now, as I shall presently have to mention the Safi again, and more in detail.

With the Gandhari of the old stock—the Gandaridæ of the Greek—we may, I think, include as Indian Arians the anciently, as now, contiguous tribes of the *Afridi*, the *Khattak*, and the *Dadi*, which, in the book alluded to before, I have identified with the previously unknown *Aparytæ*, *Sattagydæ*, and *Dadicæ* respectively of Herodotus. Their names are identically the same, and their localities very nearly so, with those indicated by the Greek historian upwards of 2300 years ago.

As they are all reckoned by Herodotus together with the *Gandarii* in the 11th satrapy of the empire of Darius Hystaspes—the Gushtasp of Persian history—the probability is that they were cognate peoples, and this I think from their language and general polity being the same, we may conclude was actually the case, especially also as they were all

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inhabitants of one and the same tract of country—the ancient Pactiya, the modern Pukhtun-khwa. Any how, none of these tribes, with the exception of the Gandhari who have become naturalized Afghans, as just now stated, are to be considered as Afghans, nor indeed do they claim to be such. On the contrary they distinguish themselves by the proper national appellation of Pukhtun—the Pathan of the Hindustani—and are moreover independent of the Afghan government. They are nevertheless included in the modern Afghan nationality.

With these long standing inhabitants of the Suleman range—the ancient Pactiya or Pactiyica—may also, perhaps, be included, as Indian Arians of a more recent migration, the great Waziri tribe, which, in the book before mentioned, I have taken to be the same as the *Vairsi* of the *Sodha* branch of the Pramara Rajput. The Sodha, I may here observe, have been considered by Tod to be the descendants of the *Sogdi* of Alexander's time. The *Sogdii* mentioned by Arrian, were seated on the Indus below the confluence of the Chanab (*Acesines*) and this position agrees with the native account, according to which the Waziri migrated upwards to their present seat from the South east about six centuries ago, when they dispossessed the *Khattak* or *Shattak* of their ancient territory on the Suleman range.

With the Pathans above mentioned may also be classed as of Rajput origin the lesser tribes of the Dání—formerly a much more numerous and powerful people, and whose territory in the early Arab period was called Danistan—the Khatrani, the Sheorani, the Naghar, the Kasrani or Kirsani, the Miyani, the Niyanzi, the Chhotiyali, the Drig or Drigbansi, the Ghorchani, the Ghaghi, the Lodhi, the Pachhai or Pashai, and some others of lesser note, who are now incorporated or confederated with stronger tribes. All these tribes which I have just enumerated, though now professedly Musalmans, are also called, in common with the other Pathans, *Rohila* or "Rohmen"—Roh which has the same signification as *Koh*, that is "mountain," being a synonym for the country of Pukhtunkhwa, or Pactiya—and they are all represented in Rajputana and the North-West Provinces by corresponding tribes bearing precisely the same names.

Possibly also, with these tribes, as being of Rajput origin, may be included the *Tori* of the Kuram valley, though their classification in this category is doubtful. By their own accounts they are a branch of the *Tokhiyani* Turk; whilst others suppose them to be Indo-Arians of the *Tuari* Rajput, which they may very well be if we consider them to be the same people as the *Thyræi* mentioned by Arrian. However, be this as it may, none of these tribes are Afghan, nor do they pretend to be so. They are naturalized Pathans, each with its own peculiar manners and customs, dialects and traditions.

Besides these tribes reckoned as Indian Arians there is the modern *Khatri* or Hindu graindealer, merchant, and banker—our friend the Banniya—who is found in every town and village of any pretension, in all parts of Afghanistan, where he maintains his national individuality in its integrity, and even, under certain restrictions, observes his idolatrous customs and rites. He is indeed the heathen stranger within

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the gates, and is not to be reckoned among the peoples of the country, except for his great use to them in the conduct of their worldly affairs.

Having thus briefly alluded to the principal Turanian and Arian peoples, who were the inhabitants of Afghanistan at the time when the Afghans arrived in Ghor, we have next to notice the peoples of a Scythian origin. And these, according to the explanation before given of the derivation or etymology of that word, can date only from a period subsequent to that of the settlement of the Afghans in Ghor. For though the term Scythian has been very loosely employed to designate any, or all, of the ancient nomade peoples of Tatary, and has been applied to the different nations which have from time to time issued as conquerors from the steppes of that vast region, it is properly—from the view before expressed of the origin of the word itself—applicable only to the peoples sprung from the *Succothi* or *Scothi*, the "booth-dwelling" Israelites, whom we have already conducted from the seats of their captivity in Media to the steppes of their liberty in Tatary.

Hence it is that I have spoken of the peoples of the earlier migrations from that region under the general territorial appellation of TURANIANS. In these earlier Turanian migrations there was no *Scythic* element. Their peoples were of an entirely different race, and of an inferior mental calibre; as is evinced by their having everywhere in Afghanistan and India disappeared before the superior Arian and and Scythian, either by absorption into the conquering race, or by reduction to a state of servility, or else by expulsion to the deserts and inaccessible wilds of the mountains.

Whereas in the later migrations from the same region there was a *Scythic* element. Their peoples were of a different race—originally, we must admit, of the Shemitic stock—and of a superior mental calibre; as is shown by their having founded powerful sovereignties and enduring colonies, the posterity of which still possess the soil; and, as is shown more remarkably by their having established the most important religious system of the Asiatic continent—namely Budhism—which by some is held to be the prototype of our own Christianity.

So far as the country whence both sets of migrations issued is concerned, the peoples were all TURANIANS. But with this great distinction that, those of the migrations antecedent to the escape and dispersion of the Israelites of the captivity in Media were simply *Turanian Tatars*; whilst those of the migrations subsequent to that event were *Turanian Scyths*.

This view of the case is supported by the fact that the very name of *Scyth* or *Scythian* was only heard of first through the Greeks, some two and a half centuries after the dispersion of captive Israel; and, as I have endeavoured to show, in connection with a people of an undoubted Israelitish origin.

Of the precise dates of the first Scythian migrations, into the rough mountainous region of Afghanistan and the fertile valleys of the Indus, we have no specific records. But it would appear from the statements of the ancient Greek and Latin writers, corroborated by the independent testimony of European, Persian, and Chinese history, that a succession of

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invasions by colonizing hordes of *Scythian* conquerors, from the region to the north of the Oxus, took place into the countries to the south—into Afghanistan and the region watered by the Indus—during several centuries preceding and following the Christian era.

The first of these Scythic migrations into Afghanistan took place at least as early as the time of Darius Hystaspes—about 500 B. C.—and perhaps even earlier. For we find a powerful Scythian colony seated on the Indus in northern Punjab at the time of Alexander's expedition, in 325 B. C. In this region the Scythians held certain provinces, or kingships, in subordination to the paramount sovereignty of the Arians of the Puru family, whose king—the celebrated Porus—made a determined stand against the victorious arms of the Macedonian conqueror.

Of these Scythians, the principal tribes of which we find mention in the ancient classical writers, are the *Gargar*, the *Kathœi*, and the *Sobii*. Each of these tribes has its modern representative in Afghanistan—in the *Kakar*, the *Katti*, and the *Safi* of the present day. Let us say a few words about each of them in connection with the question now before us. And first of the Kakar.

The KAKAR tribe, which now holds the southern portion of the Suleman range, from the Waziri country on the north to the Baloch frontier on the south, is not mentioned by name in Herodotus, nor by the historians of Alexander's expedition. But their kinsmen in the Punjab—where they are called *Gakar*—have been identified by General Cunningham with the *Gargar* mentioned by Dionysius and Priscian—date about 300 to 350 A. D.—and he states that according to the Gakar traditions, "their ancestors were transplanted into the north-west Panjab by Afrasiyab from *Kayan* under a leader named *Kid* or *Kaid*."

Now the Kayan here mentioned must be, I think, the same name as the *Kiyan* and *Kaikan* by which the early Muhammadan writers—quoted in Elliott's "History of India"—designate the country now held by the Kakar tribe of Pathans. Whilst the name of the *Gakar* leader—*Kid* or *Kaid*—bears so striking a resemblance to the *Kish* or *Kais*, who appears in the Afghan traditions as the common ancestor of their modern nationality, and the progenitor of their *Kakar* tribe through his third son *Ghurghusht* that, I think, there can be no doubt the two names refer to one and the same person.

General Cunningham derives the name *Gakar* from the *Sagaris* mentioned by Herodotus as the Scythian name of their national weapon—the "iron mace." According to this etymology the name *Gakar* or *Kakar* would mean "mace-men." That Scythian tribes were and are still named after some national or tribal peculiarity of custom, dress, or habit, we have ample evidence—in the name of Scythian itself, as well as in those of *Khiliji* or *Ghilzi*, "swordsmen,"—*Kizil-bash*, "red-heads,"—*Cazzac* or *Cossack*, "robbers,"—*Kirghiz*, "steppe wanderers,"—*Caracalpac*, "black-caps,"—&c.

But however this may be, the point to which I would draw your attention is the identity of the *Kakar* of Afghanistan with the *Gakar*

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of Panjab. I have quoted the Gakar tradition of their origin from *Kayan* under a leader named *Kid* or *Kaid*, and have pointed out the identity of these names with the Kakar country *Kiyan* or *Kaikan*, and progenitor *Kish* or *Kais*. And I may now add that the Kakar of Afghanistan themselves claim kinship, not only with the Gakar, and Gadun of the Punjab, but also with the Tymani tribe of the Chár Aymac, (=four settlements or colonies) which is settled in the western parts of the Hazarah country near Herat.

It would seem that on their way to the Suleman range from their previous seat in Hyrkania—the modern Gurgan—the Kakar took the route by Herat, and for awhile probably settled in the Ghor territory there which is now occupied by their Tymani colony. In the Suleman range the Kakar must have intruded upon the lands previously, and for some centuries after their arrival, held by the *Dadicæ* of *Herodotus*,—who are now represented in the same locality by the *Dadi* tribe, which has long since been incorporated with the latterly more powerful Kakar. The change of position in point of dominance here—between the previous *Dadi* possessors and the later Kakar conquerors—probably took place during the period of the Scythian ascendancy in Punjab where the kindred Gakar colony was already firmly established in the country between the rivers Indus and Jhelam, their present seats being in the districts of Rawal Pindi and Hazarah (our Abbotabad).

That the Kakar, Gakar, or Gargar are not mentioned by Herodotus may be explained on the supposition that in his time the Dadicæ or Dadi were the dominant people in that district of Pactiya which, at a later period, came to be known by the name of Kayan or Kaikan—the modern Kakaristan or Kakaran—and that the Kakar only subsequently rose to the supremacy; when, supplanting the Dadicæ, they gave their own name to the country—a name which in the works of native writers, owing to the omission of diacritical points, has been variously rendered by European translators as Kiyan, Kikan, Kayan, Kaikan, Kaikanan and Kakaran.

This supposition is supported by the fact of the actual presence of the modern representatives or descendants of the Dadicæ of Herodotus in the now Dadi section of the Kakar tribe.

Although the Kakar are now classified in the genealogies as Afghans, they are not considered to be of Afghan descent, but are distinguished as Pathans, being included in that distinct nationality owing to their being naturalized inhabitants of Pactiya or Pukhtunkhwa. They are Afghans only by adoption into that confederated nationality of different peoples. At the present day the Kakar is a numerous and important tribe in Afghanistan, and is largely engaged in trade with India. The assafœtida, wool, and horse trades of western Afghanistan are mostly in the hands of Kakar families. Considerable numbers of this people are regularly employed in the collection of assafœtida and purchase of horses in the country round about Herat.

The Kakar consider themselves to be of distinct descent from the Afghan, but, like them, they also claim to be Bani Israil. In fact in the

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modern Afghan nationality they are only Pathans, as just now stated, that is Pukhtuns, Pactiyans, or Picts—as being naturalized inhabitants of the country called Pakh or Pukhta, Pukhtunkhwa, Pactiya or Pictland. Properly they are Scyths or Scots.

We next come to the KATTI of Afghanistan, whom I take to be the kinsmen of the *Kathi* of Punjab—the people identified by General Cunningham as the modern represenatives of the Kathæi of Alexander's historians. The word *Katti* in Pukhto is spelt with the hard *t* which brings it into conformtiy with the Hindi *Kathi* and Greek *Kathæi*.

At the time of Alexander's expedition the Kathæi were seated on the river Ravi, and occupied the country between Lahore and Multan. At a subsequent period they extended their power further southward and founded the colony of *Kathiawar*, which is now included in the Bombay Presidency. It would seem that this people, on their way through Afghanistan to Punjab, left a colony at or near *Ghazni*, which gave its name to the modern district of *Kattawaz* or *Kattawar* to the south-east of that city, and adjoining the settlement of the kindred Kakar tribe which I have just now mentioned.

The *Katti* or *Kathi* do not now appear as a distinct people in Afghanistan. They are for the most part incorporated with the great Ghilzi tribe of the present day. In earlier times they were probably, like the Kakar of to day, an independent people; but being situated in a more open and less defensible country they succumbed to the advance of more powerful tribes. It would appear that they were at one time spread over the whole country from Katawaz on the south to the Kabul river on the north. For in this tract we still find the small tribes of *Katti*, *Kuttikhel*, *Kuttakhel*, and *Kattozai* interspersed amongst the mixed population of this part of Afghanistan.

The Katti claim to be Bani Israil, but they consider themselves a distinct people in descent both from the Afghan, in whose nationality they are included, and from the Ghilzi, amongst whose tribes they are now reckoned. Properly, like the Kakar, they are Scyths, though now naturalized Pathans of the Afghan nation.

Above the Katti, towards the north-east, we find the *Safi* or *Sapi* tribe. This people I take to be the modern representatives of the ancient Sobii, Sibœ, or Sabæ, as the name occurs in different ancient authors—the subjects of the king *Sopeithes*, or *Sophitus*, who tendered his submission to Alexander, and whose territory extended over the Salt range between the rivers Indus and Jhelam.

General Cunningham, in his account of the ancient Sobii, says that, "according to the concurrent testimony of Alexander's followers the Sobii were the descendants of a colony planted by Hercules," and he quotes that "they wore skins like Hercules and carried clubs!" and further that, "they branded their oxen and mules and carried clubs." He also suggests that the name of the king Sopeithes is probably only the Greek form of the native term *Chob-pati*—"Lord of the club"—a name which in the later Hindi form of *Chob-nath*, was the actual title of the chief of Bhera, the ancient capital of the Sobii on the Jhelam—not only

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because, as he observes, " King Sopeithes himself carried a golden truncheon set with beryls which he gave up to Alexander as a symbol of authority," but also because Ferishta, in his history, couples a tribe named *Chobia*,—or" Club-men"—with the Gakar " as ancient Zamindars of the Punjab."

Now the names of the Greek *Sobii* or *Sabæ*, the Hindi *Chobia*, and the Pukhto *Safi* or *Sapi* are identically the same word, and, coupled with the locality in which they are found, indicate that they belong to one and the same people. The allusion to Hercules as the founder of their colony, recalls the Greek account of the Scythian progenitor which I have mentioned in a previous passage, and testifies to the Scythian origin of the Safi. That the Sobii or Sibœ (the Sabæ of Dionysius) wore skins and carried clubs, as mentioned by Curtius and Arrian, is another circumstance confirmatory of their identity with the Safi of the present day, who still do so to some extent, and probably wore skins and used clubs much more generally when they too—not so very long ago—were reckoned as Kafir, like their immediate pagan neighbours in Kafiristan. It would be interesting to ascertain whether the mark with which the Safi brand their cattle—for they do brand them—it still the sign of a club.

From this identification, it would seem that the Sobii or Safi, like their cognate Gargar or Kakar, and Kathæi or Katti, on their way to the valley of the Indus also left a colony behind them in Afghanistan—as a rear-guard, or reserve, perhaps, in the secure retreats of the mountains.

The Safi of Afghanistan, though they still completely maintain their tribal individuality, hold but a very subordinate position among the peoples of that country, being employed mostly as labourers, farm servants, cattle graziers, and so forth. A couple of years ago, before the commencement of hostilities in Afghanistan, I met three or four Safis amongst a gang of labourers employed on the Simla waterworks, and entering into conversation with them learned that they had come from Tagao. They quickly became suspicious of my enquiries about their country and immediately tried to deceive me by lies.

In Afghanistan the Safi are now found principally in the lower valleys bordering on Kafiristan, from Tagao to the Kama river ; and also in Swat and Bajawar, and in the Mahmand hills, where they are now coupled with the Gandhari whom I have before mentioned. Prior to their conversion to Islam they were reckoned with the people of Kafiristan ; but now they are about the most zealous and fanatic of Musalmans in that last independent stronghold of Muhammadanism, and furnish many devotees to the priesthood of that country. They claim to be Bani Israil, but hold themselves a distinct people, both from the Afghan with whom they are nationally associated, and from the Gandhari with whom they are coupled as a tribe in the brotherhood of Islam and a common neighbourhood. They are included among the Pathans, but properly they are Scyths.

The late Abdul Ghafur—"Servant of the Pardoner"—Akhund of Swat, who was the celebrated saint and king of that country till his death

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only a few years ago, was a Safi. And it is said that the aged Mulla Muhammad, the Miskini 'Alam—"Humblest in the Universe"—of whom we have recently heard so much as the *Mushki Alam* of Ghazni, the spiritual leader of the Sherpur assailants last December, is also descended from a Safi family.

I have now briefly noticed the three principal tribes which settled in Afghanistan during the first migration of the Scythians towards the south—about five centuries before the Christian era, and about two centuries after the dispersion of the Israelites of the captivity in Media—and have identified them with their kinsmen who at the same period colonized the north-west Punjab.

It is a curious coincidence and significant—significant of a simultaneous and confederate migration from the same locality—(the ancient Hyrkania, the modern Gurgan) that these three early Scythian tribes should be planted in contiguous colonies both in Afghanistan and in Panjab; and that they should in both countries maintain a distinct individuality in respect to tribal descent. So marked was this in the case of the ancient Sobii that Curtius remarks "they had many customs still among them, which showed they owed their origin to the Greeks," to which opinion he was apparently guided by the fact of their wearing skins and carrying clubs like Hercules. However, those of these Scythian tribes who are now in Afghanistan, claim to be Bani Israil, though they deny a direct descent from the Afghan, as well as a common lineage with the greater tribes amongst the clans of which they are now reckoned, so far at least as concerns the Katti and the Safi. Yet they all admit their adoption into the modern Afghan nationality. If their claim to be Israelities is allowed on the score of their Scythian descent, then their kinsmen in Punjab must also share with them in the glory of the title "Bani Israil."

We have now arrived, in point of time, at the period of Alexander's expedition, and the Greek dominion of his successors in Afghanistan. Though the Greek rule endured for nigh two centuries before it was swept away by the next great Scythian migration from the north—about 126 B. C.—it has left no vestige of its existence amongst the present inhabitants of the country beyond dynastic coins, and the traditionary lineage of a few individual families in an obscure and inaccessible locality. And this simply because the Greeks held the country as military conquerors—much as we hold India—and not as conquering colonists as were their Scythian predecessors and successors. This most interesting and instructive period—our knowledge of which is derived from the accounts of the ancient classical writers and the legends of the coins found in the country—does not, therefore, claim our notice in connection with the question just now under consideration.

The great Scythian invasion which destroyed the Greeks in Bactria and in Ariana—the modern Afghanistan—was the consequence of one of those migrations of entire nations, which in ancient times so often flooded the adjacent countries of Europe and Asia with swarms of a strange people from the vast steppe region of Tatary.

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In the instance which we are now considering the migration was caused by the pressure of a multitudinous Tatar horde advancing from the distant north-east and pushing forward the Scythian peoples seated upon the upper Jaxartes down upon the peoples seated upon the upper Oxus, who in turn were impelled forward into Afghanistan. Our information regarding this great movement of nations towards the south is mainly derived from the accounts preserved by the Chinese.

From what has been published of these in European literature, we learn that a people named *Su*—who are the Saka of Persian, Indian and European writers—and associated with them another people named *Tahia*—who are the *Dahi* of Persian, and the *Dahæ* of Greek and Latin writers—were ousted from their contiguous countries of *Tahia* and *Sughd*—or *Dahia* and *Sogdia*—and driven southwards into the ancient Ariana—the Afghanistan of our day—by a third people named *Yuchi*.

These Yuchi—the word is the Chinese form of the Greek and Latin *Getæ*, and the Persian and Indian *Jattah* or *Jat*—like the Su or Saka, were a Scythian people. And they were now impelled forwards from their seats in the north, about and beyond the upper courses of the Jaxartes, by the advance of a totally distinct people—the *Hiungnu* Tatars.

This expulsion of the Su or Saka, and the Tahia or Dahi by the Yuchi or Getæ took place about the year 126 B. C., when they burst across the barrier of Hindu Kush, and overran the whole of western Afghanistan, where they formed two great and distinct colonies of their respective hordes—colonies which were more or less, owing to diversity of race, constantly at enmity one with the other.

The Saka, proceeding to the south-west, occupied the greater portion of the provinces known to the Greeks of that age by the names of Arachosia, Drangia, and Aria. The territory thus overspread by these Saka was called after them *Sakastana*—that is "Sakaland," or Saxony as we should say. The name appears in different forms in books, as *Sakastene*, *Sagistan*, *Sejistan*, *Seistan* and *Sistan*.

With the lapse of time and changes of sovereignty, the territory of Sakastana—which originally extended from about Sabzwar or Isapzar (to the south of Herat) on the west, to Mukur at the sources of the river Tarnak on the east; that is, which originally comprised the modern provinces of Sistan and Kandahar together—has dwindled away even more than has the name itself, and under the existing political conditions is restricted to the small district immediately about the basin of the Sistan Lake, which is formed by the river Helmand terminating there.

In this province of Sakastana, the Saka established a Scythian dynasty which endured probably to the end of the first century of the Christian era. The best known of the kings of this dynasty was the Gondophares of the coins, who, as General Cunningham has observed, "is almost certainly the same as Gondoforus of the early Christian legends, who is said to have put St. Thomas to death."

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This Saka dynasty gave way to that of the Parthians—who were another Scythian people, from the east of the Caspian, or from Khiva—under their Arsaki sovereigns. The dynasty of the Arsaki, or Arsacides, was in its turn supplanted by the cognate *Sassani* dynasty, which acquired the sovereignty of the whole Persian Empire. I need not here dwell upon the clearly manifest connection of the names *Arsaki* and *Sassani* with the Scythian national appellations of *Saka* and *Sakasuna*, but will merely observe that the Sassani dynasty endured till the time of Muhammad, shortly after whose death the Arabs appear upon the scene with a counter stream of the pure Shemitic element.

This brings us down to about the middle of the seventh century, when the Afghans first emerge from their obscurity as Israelites in Ghor, and join the Arab invaders with all the zeal of new proselytes to a conquering religion similar to their own of the Mosaic teaching.

In the long series of military expeditions by the Arabs against India through southern Afghanistan, the Afghans took a very prominent part, and thus acquired that dominant position, amongst the various different peoples who composed the population of Afghanistan, which they have retained ever since; and which, in the time of their prosperity as a paramount power, led to their incorporating into their own nationality all the various tribes in the country which now bears their name, excepting only those of the acknowledged Persian and Tatar races.

The Afghan name figures prominently in the military achievements of the Muhammadan arms in India during the successive Islamite dynasties, from the time that Mahmud of Ghazni first invaded India, in the beginning of the eleventh century, till the time that they themselves—first acquiring power and influence at home as the raisers and supporters of the native Ghor dynasty—at length usurped the sovereignty, and finally reigned as Kings of India, from near the close of the thirteenth to the early part of the sixteenth centuries, when they gave place to the Moghals.

It was during this period—interrupted as their rule was—that the soil of India became planted with those Afghan feudal baronies, military colonies, and emigrant settlements, which are found to this day scattered all over the country, from the heart of the Dakhan to the borders of Kashmir. It was during this period also that the Afghan traditions of their Israelite descent were, most probably, reduced to order and committed to writing in their present form, and that their genealogical lists of the newly developed Afghan nationality were concocted. It was during this period also that the Afghan mind imbibed those lofty pretensions to the possession of Hindustan, which it still cherishes with fond imaginations of the eventual realization of a claim based upon the hereditary rights of conquest. However fanciful we may consider their pretensions to be they have nevertheless a firm hold upon the national mind, and are not without their influence upon the foreign relations of their Government, and have all along guided the course of their history.

That the Persian peoples—the Tajik—were not included with the Pukhtun peoples—the Pathan —is intelligible for obvious reasons; the

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chief, because they were Persian and not Afghan or Pathan. Whilst the Tatar people of Hazarah were so manifestly distinct a race that they could only be considered as foreigners in the land.

Let us now return to the Scythian migration of which I was just now speaking.

The *Su* or *Saka*, who then came into Afghanistan and founded the *Saka* dynasty in the ancient Sakastana—the modern Sistan—were a branch of the original Israelite *Succothi* or *Sugatai*, under the various forms of that name before mentioned. All these names we must consider as comprehensive national appellations of one and the same great people, or of the great nations into which it branched, and as including numerous different tribes, some of Scythian, and some of Turanian, and others again of mixed origin.

Of these Saka, then, who came into Afghanistan with the migration before mentioned, there are some tribes whose names appear in the works of the ancient classical writers; and those names, I think, afford a clue to the discovery of their modern representatives amongst the present population of Afghanistan. They are the *Sakai*, the *Mandueni*, the *Mardi*, and the *Xandii*.

The *Sakai*, it would seem, was the leading tribe, and took its name from that of the whole horde. At the present day the Sakai do not exist in Afghanistan as an independent or distinct people. Their modern representatives, however, are, I think, to be found in the *Sakzai* or *Ishaczai* tribe of the Abdali-Afghan, and also in the *Sak* or *Sahak* clan of the Ghilzi people.

The *Sakzai* still occupy the central seat of the country held by the ancient *Saka*, and are found mostly about the northern parts of the modern district of Sistan, where their head quarters are at Lash-Juwen. The *Sak* of the Ghilzi, on the other hand, are found in the country to the south and east of Ghazni, where their head quarters are in Zurmat. There are, most likely, other representatives of the ancient Saka in these parts, but their names do not occur to me just now.

Both these tribes claim to be Bani Israil; but the *Sakzai* are now entirely identified with the Abdali-Afghan; whilst the *Sak* consider themselves a distinct tribe from the Ghilzi with whom they are confederated, and from the Afghan in whose nationality they are incorporated.

Of the *Mandueni*, *Mandrueni* or *Medi* of the ancient classical authors—the *Mand* or *Med* of the early Muhammadan writers—we have, I think, the modern representatives in the *Mandanr* division of the Yusufzai, and the Mahmand tribes of the Peshawar valley. Both these tribes, before their arrival in Peshawar with the return migration of the Gandhari—which I have alluded to in a previous passage—were seated on the Tarnak tributary of the Helmand river. This position, as before stated, was probably the seat of an earlier occupation by the same Turanian people before their connection and assimilation with the later Scythian.

The ancient *Mardi*, whose early seat was in the modern Persian province of Mazandaran, may, perhaps, be represented by the present

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Wardak of the Loghar valley, who still maintain a tribal individuality entirely distinct from the Afghan. They consider themselves, however, to be descended from the Arab invaders of the early Muhammadan period, and are hence commonly said to be a Sayyid tribe. It is quite possible that they may have come into their present position with the Arab armies which overran this region towards the close of the seventh century. But they claim to be Bani Israil also.

The ancient *Xandii* or *Xanthii* of Strabo may, perhaps, be represented in Afghanistan by the modern *Khundi*, some of whom are found among the Kakar, and some among the *Dahi* of Hazarah. The former are said to have sprung from emigrants originally from Khojand on the river Jaxartes. Both are distinct tribes amongst the peoples with whom they are now associated, though those in Hazarah are now called *Dahi Khundi*. Perhaps both the *Khundi* and the *Mand* represent original Turanian or Tatar tribes become naturalized Scythians. The *Dahi Khundi*, at all events, are a Tatar people now.

This brings us to the consideration of the other horde, which I mentioned awhile ago, as associated with the Saka in their migration into Afghanistan—namely, the *Tahia* or *Dahi*. They apparently stopped short in the northern part of the country and occupied the *Paropamisus* of Alexander's time—the Ghor of the Arab period, and the Hazarah of our day—where they found some earlier settlers of their own people, as well as some Afghans and some early Arians, both Persian and Indian, whom they drove out of the hills to their kindred peoples in the lower valleys and the plain country.

In this inhospitable mountain region these *Dahi* still maintain their position as a distinct Tatar people as to race type, though they are now professedly Musalmans, mostly of the Shia sect, and speak a dialect of the ancient Persian language, in which are found some words of Turki and Mongolian origin. Their peculiar race type has probably been largely renewed by a fresh infusion of the prime stock through the invasion and colonization of the Mongols of the army of Changhiz Khan, in the thirteenth century.

The Dahi of this Scythian migration, together with the Mongols, who, at the later period mentioned, joined them, are now collectively known by the name of *Hazarah*—apparently after that of the country of their occupation. I have already alluded to the other supposition regarding the derivation of the name Hazarah, and stated my own idea of its probable origin in Afghanistan, and will now only add that Hazarah is not the native name of the people who are called by it—at least it is not so in Afghanistan.

When at Kabul last December, I made out a list of the different tribes inhabiting the eastern half of the Hazarah country, and no where met with a single tribe, or section of a tribe, bearing the name of Hazarah, though my information was derived from well informed chiefs and intelligent natives of the country. The name in fact is a mere territorial appellation, as Jagatu Hazarah, Jaghuri Hazarah, Bihsud Hazarah, Dahi Zangi Hazarah, &c., meaning those tribes of the Hazarah country.

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According to the information then collected, the whole of Eastern Hazarah is peopled by a distinctly Tatar race, which is divided into a number of great tribes each comprising several separate clans. And these tribes appear to belong to four distinct migrations, the earliest of which probably gave the country its aboriginal Turanian population, and is now represented by the Taka tribes before mentioned and probably some others of lesser note.

The next migration of Tatars into this region is that of the *Tahia* or *Dahi*, who came in with the *Su* or *Saka*, about 126 B. C., as before stated. They are now represented by the *Dahiya*, and Fulada, the Dahi Zangi, the Dahi Chopan, the Dahi Rawad, the Dahi Khundi, and others.

The third migration of Tatars into this country took place probably with the Yuchi Scythian invasion which I have to notice presently; or perhaps later in the time of Subuktakin the Turk. To the Hazarah tribes of this immigration, may perhaps be referred the Jagatu, the Jaghuri, the Baghochari, the Yanghur, the Bihsud, and others. Whilst to the last immigration under Changhiz Khan may be referred the various *Sokpo* tribes now known as the *Sagpae*, the *Sagsokhta*, the *Sagdin*, the *Dum Sagan*, &c. The *Sagpae* are now one of the most numerous divisions of the Bihsud Hazarah.

The Tatar word *Sokpo* or *Sokpa* simply means "belonging to the Saka," and is an appellation signifying the association of these Mongol Tatars with the Saka or Scythian people, as their dependents or conquered subjects, and does not imply Saka descent. Just as amongst the Tatars of Ladak the Bhotias residing in the district of Purik are called Purikpa and so on for other districts (the feminine particle in each case being *ma* or *mo* instead of *pa* or *po*, as Sokmo, Purikmo, &c.), *Brokpa*, "hillman," &c.

Even the word *Dahi* itself—the Chinese *Tahia*—which is the appellation of the Turanian Tatar horde which accompanied the Scythian *Su* or *Saka* in their migration into Afghanistan, mentioned awhile ago, is not—as pointed out by General Cunningham—a native word, but the Persian form of the Zand *dahyu*—"robber"—the Sanskrit *daku*, the Hindi *dakait* (our "dacoit"), and the Latin *daci* as applied to the Scythian Getæ or Goths of Thrace—the Dacians (or Dakians) of our books.

The name Dahi, it would seem, was applied to the Turanian Tatars by their Scythian conquerors—just as the term *daku* or *dakait* is applied in India—as an epithet of reproach, and came to be adopted by the people themselves—as we have seen in other instances—as the name by which they were most generally known, and thus it stuck to them as a national appellation. The modern *Cazzac*—"robber"—(our Cossack) of the steppes of Russia and Tatary, probably, got their name much in the same way, if indeed they are not a branch of the same people under a native name of the same import as that of the foreign Dahi.

However, be this as it may, the Dahi and other Tatar tribes of the Afghan Hazarah country are not Saka or Scythian by descent. They

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are pure Tatar of a strongly marked Mongol type, and of an entirely different stock to the true and originally Shemitic Scythian. They constitute, in fact, a distinct nation within the territories of the complex Afghan Hazarah nationality; and as such they have maintained their race individuality in complete integrity, and their national independence also to a considerable extent.

In Afghanistan they are a perfectly foreign people. Those of them who dwell in the easily accessible parts of the country have been reduced by their more powerful neighbours to a state of dependence and servility little short of slavery; whilst those occupying the inaccessible retreats of the mountains have, through their naturally strong position, developed warlike and predatory habits which have enabled them to maintain a more or less complete independence within their own limits.

We may in fact consider these Hazarah Tatars as the Cossacks of Afghanistan. Or, to revive the old name, the Dahi of Afghanistan; and their country we may consider as Dahistan—a name which I have some reason to believe is not entirely unknown to, or unused by the people themselves instead of the usual Hazarah. Anciently the Dahi were a people of considerable military repute, and Alexander the Great, after subduing them in their own country (Bactria), enrolled a strong contingent of their warriors, amongst other local levies, and they rendered him good service throughout his military exploits in Panjab.

All these Hazarah Tatars are looked upon as contemptible foreigners in Afghanistan, and being considered a servile race are excluded from the Afghan, the Pathan, the Tajik, and the Ghilzi nationalities alike. They are certainly not "Bani Israil."

This migration of the *Su* and *Tahia*—the Saka and Dahi—which I have thus briefly referred to as having been caused by the pressure from the north of the Yuchi, was followed, less than a century later, by the migration on a grand scale of the Yuchi themselves. This name Yuchi, you will remember, is the Chinese form of the native and Persian *Jattah*, which we meet with in books under the various forms of *Gauthai*, *Getai*, *Getæ*, *Jattah*, *Jat*, and *Goth*, and also, as some consider, in the *Gitano* or Gipsy of Europe. All are held to be derived, as before explained, from the original Israelite *Succothi*, or *Sagatai*, by the elision of the initial sibilant.

I have before noted the different modifications of this name worked by time and the mouths of diverse nations, as represented in books, from the assumed original *Scothi*, *Succothi*, or *Sagatai*, with its Great and Little divisions of *Mas-Sagatai* and *Thyr-Sagatai*, or Mas-Sagetæ and Thyr-Sagetæ. Namely, the forms Zagatai, Jagatai, Chaghatai, Scothi, Skuthai, Scyth, Scythian, Scotus, Scot, Saka, Sakasuna, and Saxon. And I will here repeat that these various forms of the original Succothi or Scothi are to be considered, not as tribal names merely, but as national appellations of one and the same people; and as including various subordinate Scythian tribes, as well as others of Turanian or Tatar descent which have become incorporated with them, either by conquest or dominating influence, into the paramount Scythian nationality.

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And hence it is that we find the Dahi Tatars and Sokpo Mongols associated with the Saka Scythians, and the Jagatu or Chaghatai and other Tatars with the Yuchi Scythians. It is important to understand this definite signification of the word used in its various forms as the name of the Scythian peoples, as well as its extended application in the sense of a general national appellation, in order to distinguish the peoples of different origins included under the common denomination. Let us now return to our notice of the Yuchi.

Of the Yuchi, who shortly before the Christian era migrated into Afghanistan and thence, during the first century of that era, spread into Panjab, the tribes, of which we find the modern representatives in Afghanistan, are the *Tokhi*, the *Khilij*, the *Epthali* and the *Kator*.

The leading tribe of this Yuchi horde appears to have been the Tokhi, which afterwards sank from its position of dominance, and in Afghanistan became absorbed by the Khilij of which it now forms a separate clan. The Tokhi, or, as they are also called, the Tokhari, Tokhiyani, and Tughiani, on the expulsion of the Su or Saka from Sughd or Sogdia, occupied the mountainous districts drained by the northern affluents of the upper Oxus; and the country came to be called after them Tokharistan.

In later centuries the Tokhari or Tokhi rose to so paramount a position of pre-eminence in Central Asia that they not only absorbed their kindred Yuchi tribes but also gave their name—in its later form of Turk—to a new nationality which swallowed up all the others of Scythian origin in the wide region of Central Asia—extending from the steppes of the Jaxartes and the deserts of Siberia on the north, to the great mountain chain of Hindu Kush, Himalaya and Kuenlun on the south; from the Caspian Sea and Ural mountains on the west to the Gobi desert and frontier of Mongolia on the east.

In this vast extent of territory the old names of Turan and Tatary gave way to the later one of Turkistan or Turkland—the Turkey of Central Asia. And its peoples of diverse races came to be distinguished by the general national denominations of *Turk wa Tatar*—that is Turk and Tatar or Mongol—in the northern parts, and *Turk wa Taz*—that is Turk and Tajik or Persian—in the southern parts. In other words Mongol races in the north, Arian races in the south, and Shemite races between them.

Our notice of this great people is confined just now to the original Tokhi or Tokhari, or Turk tribe, which not only established a prosperous colony in Afghanistan, extending from the Indus to the Helmand, and a kingdom the seat of which was at Kabul, but founded in Punjab an Indo-Scythian Sovereignty which completely altered the previously existing polity and gave a new aspect to the national life of the country.

According to the Muhammadan historian Abu Rihan, as quoted in Elliott's "History of India"—date from 970 to 1039 A. D.—the Turk dynasty of Kabul lasted during sixty generations, and was then, about the beginning of the tenth century, succeeded by a Brahman dynasty. Abu Rihan gives the name of the first king of the Turk dynasty as

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Barhtakin, and relates a curious story of his mysterious appearance in Kabul territory, which is significant of the sudden and unexpected invasion of the strangers and their easy conquest of the country.

The name of the Turk king *Barhtakin* is evidently a word of the Turki language of Abu Rihan's time, and probably a modification of some earlier form, as it differs entirely from the names of his successors which have come down to us on their coins and in books. The most celebrated of these Turk kings was the *Kanishka* or *Kanerki* who became a convert to Budhism and revived its culture throughout his dominions. Many of the Budhist topes and monasteries, the ruins of which are now found all over the country between Peshawar and Ghazni, date from this period—about half a century before the Christian era.

Of this Turk people we have now many representatives amongst the tribes of eastern Afghanistan, and the most important of them are, I think, to be found in the great Khiliji or Ghilzi tribe, which is spread over the country from Jalalabad to Jaldak beyond Kilati Ghilzi. The Ghilzi of Afghanistan constitute one of the distinct nations composing the confederated and complex Afghan nationality of our day, and though they now comprise a large number of subordinate tribes, some of which are of acknowledged foreign descent, they originally consisted only of a few clans, the chief of which now found in the country are the *Tokhi*, the *Hotaki*, the *Andari*, and the *Taraki*—all in the country between Shalgar and Jaldak.

The name of the tribe itself—Ghilzi or Ghilji—is the modern form of the original Khilichi or Khiliji—"Swordsmen"—who were anciently seated, as a tribe of the Yuchi, on the Jaxartes. Their Tokhi clan, it would seem, is a branch of the original Tokhi or Tokhari of the Yuchi, and was formerly much more numerous and powerful in Afghanistan than it is at the present day. In the time of the Turk dynasty it was the leading tribe, and spread largely into the Indus valley, where its several divisions were known by the general tribal appellation of Tokhiyani or Tughiyani Turk—the name which appears also to have been used as that of the whole Yuchi horde in Afghanistan at that period.

The Ghilzi consider themselves a distinct people both from the Afghan and the Pathan with whom they are now associated in a common nationality by the ties of a common language, common religion, and common national interest. Though, as regards the last, they have always been the political rivals of the Afghan for the supremacy in Afghanistan, and even now maintain a greater or less degree of independence of the Afghan government. They claim to be Bani Israil, and are said to have been at one time Christians. They are now zealous Musalmans of the Sunni sect. They came into notice as a military race in the time ef the early Arab conquerors, and still maintain a high repute for their martial qualities. They did not, apparently, accept Islam till long after the Afghans did so. This Tokhari or Turk dynasty, after flourishing for upwards of two centuries, was much weakened by the hostility of other tribes, and was temporarily interrupted for about half a century,

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by the rule of Hindu Kings in Kabul, till finally—about the beginning of the fifth century—it was divided into two branches, one of which ruled at Kabul and the other at Peshawar. This split was caused by the irruption of a fresh horde of the Tokhi or Tokhiyani Turk, which established itself at Peshawar, under an independent king of the Royal Kator family. The Turk dynasty of Kabul, as before stated, lasted sixty generations according to Abu Rihan, who speaks of its sovereigns as the *Katorman* kings, thus indicating that they all belonged to the Kator family or tribe. The modern representatives of these Katorman Turk are found amongst the Kator or Katar people of Chitral—the title of whose chief is still *Shah Kator*—"King of the Kator"—and those of Yasin and the higher valleys of Kafiristan. Doubtless other Kator tribes exist amongst the obscure peoples of the unknown mountainous country between Kabul and Kashmir.

Of the Tughiyani Turk the modern representatives in Afghanistan are to be found amongst the various tribes included in the *Kirrari*, *Karlanri*, or *Turklanri*—that is "Turk Brotherhood"—division of the Afghan genealogical tables; but the names in these are so mixed that it is difficult to select the right ones, where we find the Afridi, the Orakzi, and the Bangash ranged with the Waziri, the Tori, the Khugiyani, and others. There is indeed much uncertainty regarding the origin of these tribes. For if we consider the *Aspii*, the *Thyræi*, and the *Arsaci*—against whom, according to Arrian, Alexander made an expedition in the course of his march to the Indus—to be the same respectively as the modern Asapzi or Yusufzi, the Tori, and the Orakzi, whose present positions agree with the localities indicated by that historian, then we must relegate these tribes to the category of the Indian Arians, as subordinate divisions of the ancient tribes of the Gandarii and Aparytæ—the modern Gandhari and Afridi.

Otherwise we must, in the absence of better information, reckon them with the Tughiyani Turk as Scythians; though my own inclination is to class them with the Indo-Arians in preference to the Scythians. However, in this last category, we may perhaps reckon with more certainty as of the Tughiyani Turk the different petty Mangal tribes settled about the sources of the Kuram river, if indeed they be not of later arrival. The chief of these tribes are the Jaji or Zazi, the Lajja, the Khitai, the Chakmani, and a few others which are all now naturalized Pathans, and commonly reckoned as offshoots of the Ghilzi.

Associated by position with these Mangal tribes are the *Jadran*, who still preserve intact their Tatar individuality. They probably came into these parts as a servile tribe with the others—amongst whom they are a very poor and subordinate people. In general appearance and character they resemble the subject Hazarah Mongols, but they do not seem to have any connections or dealings with them now.

About a century before this irruption of the Yuchi brought these tribes of the Katorman and Tokhari Turk into Afghanistan, another horde of the Yuchi had already established the dynasty of the White Hun in Sogdia under a king called Shelun by the Chinese. His dynasty was broken up, in 494 A. D., by the rebellion of a military chief who had

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risen to power and fame by his victory over the Persian King Feroz; and who now, after the defeat and death of his sovereign, marched off towards the west with an army of 100,000 men, and proclaimed himself Khan of the White Hun.

The name of this leader, in the Chinese form, was Apo-chi-lo or Apo-ti-lo—the Ephthalanus king of the Ephthalites, of Theophanes of Byzantium, as quoted in a note by General Cunningham—and is the source whence is derived the name of Nephthali, or Ephthali of the White Hun. It is supposed also by some to be the source of the Abdali of the Afghan, as I have already explained.

Now, it is quite possible that these Nephthali or Ephthali of the White Hun may be the ancestors of the Abdali Afghans since their separation from the main horde of the Hun took place a good century and a quarter before the Afghan appears at all upon the page of history. But from what I have before advanced regarding the origin of the names Afghan and Abdali, and from the fact that the Abdali are the recognized true Afghans, I think it is more probable that the Ephthali of the White Hun remained a distinct people under the great Yuchi national denomination of Turk, and that they are now represented by the Turkman or "Turk people" of the Marv steppes, a situation which accords well with the direction taken by the revolted general with his followers.

These Scythian migrations were the last great colonizing invasions of Afghanistan. The subsequent successive military expeditions of the Arabs, and the devastating inroads of the Mongols (or Tatar) under Changhiz Khan, of the Mughal Turk (or Scythian) under Tymur, and Persian Mughal (or Arian) under Nadir Shah—apart from their late occurence in connection with the subject of our present discussion—left no great or permanent mark upon the general population of the country, beyond the few isolated communities or scattered families met with here and there. The testimonies of the destructive passage of their ancestors may be read more clearly and abundantly upon the altered aspect of the country, now covered in every direction with the marks of their handiwork—to wit, its ruined cities and depopulated areas.

Excepting a few tribes of Arab descent, who are now called Sayyids and are more or less naturalized with the different Pathan peoples amongst whom they have settled, there is no distinctly Arab tribe to be found in Afghanistan at the present day. The Wardak and Ushtu-rani are said to be of Arab descent, and the Sulemankhel section of the Ghilzi is also considered to be of the same origin. The Sulemankhel, I think, may perhaps be the modern representatives of the ancient Solymi of Syria who it is known were largely employed in the armies of the early Arab invaders.

The invasion of Changiz Khan left scattered families of his followers amongst the Mangal tribes at the head waters of the Kuram river, and also amongst the Chitral tribes at the headwaters of the Kunar river and in the adjoining districts of Hindu Kush, where they are perhaps the same people as those who are there now known by the name *Mughali, Moali, or Muali.* Also whole tribes amongst

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the Dahi of Hazarah where, as before indicated, they are known under different modifications of the name *Sokpo*, and a distinct Mongol colony in the ancient Ghor country at the headwaters of the Murghab or "river of Marv." Besides these there may be some other remnants of this invasion to be found in the western parts of Afghanistan, a part of the country regarding the peoples of which our knowledge is very defective.

The invasion of Tymur left isolated families or small settlements of his followers, such as Birlas, Carluc, Dughlat, and other Turk families with Yaka, Chung, Chirikchi, and other Mughals scattered all about the country. But—except in a few localities where they are more numerous and have preserved their native language and national individuality, as in the districts about Balkh and Herat—they have mostly lost their nationality and become identified with the peoples amongst whom they dwell.

The expedition of Nadir Shah brought some emigrant families of the modern Persian or *Parsiwan* into the Herat and Kandahar districts, where they are settled about those cities, and also planted a military colony of Persian Mughal in and about the city of Kabul under the name of Kizilbash. Both the Parsiwan and the Kizilbash still preserve their distinct national identities intact, even to their national religion as Musalmans of the Shia sect, against the orthodox Sunni creed of the country.

None of these later arrivals, since the Arab invasion, of course, appear in the Afghan genealogies, nor indeed are they included in the Afghan nationality, being recognized alien peoples.

We have now very briefly alluded to most of the different nationalities composing the population of Afghanistan at the present day, and may again ask Who, then, are the Afghans? From what I have stated, clearly neither the early Turanian nor the early Arian peoples, whether Persian or Indian, can be the Afghans. Neither, clearly, can the later Mongols and Taters be the Afghans. Of the intermediate Scythian peoples—barring of course the recognized Tatar tribes associated with them in a national confederacy—none claim a descent from the Afghan, though in common with him they all consider themselves included amongst the Bani Israil. They are, however, all—together with the other Pukhto speaking peoples of Indo-Arian origin—included by the Afghans in their modern nationality or national confederacy.

But again the question occurs, Who are the Afghans who thus include the other peoples in their national confederacy? I think we must say they are *the* Afghans. The descendants of the original Naphtali of the Pekahan Israelites—the ancient Abdali of the Apakhan Bani Israil—the modern Durrani Afghan of the Saddozai dynasty of last century and the Barakzai of this, who have always held themselves distinct as the true Afghan, and whose seat is in the Kandahar country on the Helmand and its tributaries.

These people, then,—the Durrani or Abdali Afghan of to-day—I would consider as *the* Afghan, the Afghan "par excellence", the modern representative of the Israelite of the captivity under Tiglath Pileser; the modern representative of the people of the land of Naphtali, subjects of Pekah king of Israel. They, I think, are *the* Afghans.

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Of the Scythian tribes now associated with them in the modern Afghan national confederacy, and claiming with them a common Israelite origin as Bani Israil, I can only say that the circumstances, the known circumstances, of their early history, coupled with the facts of their present situation and association, if not actually justifying their claim, at least furnish a very interesting subject—and one by no means unimportant—for our investigation. Ladies and Gentlemen.

I thank you for the patience with which you have heard me out As I said on the former occasion, I fear that, to those who have come here expecting to hear a political exposition of the Afghan Question, my subject has proved a disappointment. In this case I would ask their kind indulgence, for the political aspect of the Afghan Question is a more perplexed and vexed subject, and one I do not feel free to discuss in this place.

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VI.

A NEW MODEL FOR A TRANSPORT CART FOR PONIES AND MULES, AND NOTES ON TRANSPORT ARRANGEMENTS.

BY

G. GAISFORD, CAPTAIN.

Commanding Khyber Levies.

There are many necessaries on a campaign which are difficult to transport on animals' backs, but which can be easily carried in carts. On a good road, in a good cart, a beast which can carry 3 Maunds can easily draw 12.

My own polo ponies, in a rough country cart, have constantly taken 10 maunds between Jamrood and Peshawur without turning a hair or straining in the least. I now purpose explaining a method by which, I think, a really serviceable cart could be made.

Harness.

In the first place it is essential that the harness be simple. I propose that the animal be first of all equipped with the ordinary saddle, vide sketch, made of good Cawnpore leather, but that the breast-piece and breeching be made stronger than at present.

The shafts of the cart would be fitted with an iron arrangement as shown in Plate II. Fig. 1. The breast-piece would be hooked into the front hook, the breeching into the rear one.

Both shafts would be similar, with the exception that the off one would be furnished with longer straps, as back and belly bands—the back-band being, in this instance, perforated, and the belly-band furnished with a buckle, so that both may fasten on the near side, or back-band and belly-band might be made interchangeable when the back-band will be fastened on one side and the belly-band on the other. The animal would thus require no extra gear for draught work, and could be put in a cart one day and under a pack the next. If the breast band be kept well greased and cleaned it would not require a numda or pad under it, but it would perhaps be advisable to provide one for each cart. Every transport officer and every superintendent should have a pocket leather punch with spare tubes, so as to be able to adjust the saddlery properly. Cuthbertson and Harper, I know, and I believe all the other Calcutta saddlers, sell them. During the present campaign it has been the exception to see an animal with its gear properly put on and well fitting. The Superintendent accompanying the convoy should also have a roll of fine copper wire with him, and with the punch, he could mend, temporarily, either strap or chain (vide illustration Plate II. fig. 3.)

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I must ask the reader to carefully study the rough sketch of the proposed cart. The great advantages I claim for it, in addition to its requiring no harness, are (*a*) portability, for it can be taken to pieces in a very short time and packed or boxed up; (*b*) strength, if only made under careful supervision, at a central factory and of the best materials; (*c*) interchangeability; all parts should be made by machinery and so exactly similar that a given piece of one cart would replace the corresponding part of any other, on the principle adopted in military rifles.

Carts.

The wheels should be on the present platform bullock-cart principle, gun metal boxes, spokes &c. all of exactly the same size, so as to be interchangeable.

Wheels.

The body of the cart should be made of the same description of workmanship as the platform cart above alluded to, the timber being proportionately lighter. It would be put together thus. The axle, (*a*), would be laid on the ground, a block of wood, (*b*), would be put on it. The axle and block would be perforated at (*c*). Over this block (*b*), the shafts, (*s*), would be placed. In each shaft would be three perforations, as shown in fig. 4 plate II. at *d*, *c*, and *e*; the shaft being strengthened at these parts with iron above and below.

Body.

The centre holes being over the holes in axle and axle-block, two cross beams *f.f.* perforated as shown at *g*, *d*, *g*, & *e* would next be laid *over* the shafts, the holes at *d* & *e* being over the shaft holes. A shorter cross beam, *h*, perforated at *c* would be laid over the shafts above the axle, the holes in axle, axle beams, shafts and short cross-bar corresponding.

The bed of the cart (vide fig. 5 plate II.) would be composed of four similar planks, P; each would have a cross piece (batten) of wood screwed on at *m* and *n*.

These cross pieces would be underneath and placed just beyond the fore and after cross beams, their use being to prevent the planks slipping backwards and forwards, and also to prevent them from splitting. Over these planks would be put iron bars, *r r*, to keep them down; the bar would be perforated at either end to correspond with the holes drilled through shafts and cross bar.

It would now only remain to secure the various parts together; this is done by putting in bolts at *c. c.* fig: 4 and 5, and at the four corners *d. d. e. e.* fig: 4. the corner iron-piece *d.* (fig 6 plate II.)

Under ordinary circumstances the cart would be complete when these were screwed home, but should it be necessary to put on sides, any spare bedding planks could be attached to the upright *d.* by the bolt *k.* (which has a flattened end so that the nut cannot come off) being drawn inwards to its full length, and two planks being put into positions, as shown in the sketch, fig 6. and secured by screwing home the big headed bolt.

Each plank should have a slight semicircular indentation (notch) to receive the bolt, *k.*; the iron *r*, which keeps down the planks of the bed, would have a stud on it to keep the side plank in position. The

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nuts and screws, being all made similar and of only two sizes, one wrench with a big jaw at one end and a smaller one at the other (to fit these two sizes of nuts), need only be carried with each convoy. When a number of carts have to be sent by railway, one truck would be loaded with bedding planks only, another with wheels, a third with shafts, and so on; thus each railway truck would take a full load. And there would be no waste of space. The carts would be put together at the base. At each stage spare portions should be kept, and if any cart broke down, it could either be itself repaired, or all the non-fractured portions could be used to repair other carts.

I have purposely refrained from giving dimensions as all details had better be determined by practical builders. I think, however, that 4′ 6″ would be a good height for the wheels, and that the breadth of the truck should not be more then 4′ 3″. If larger than this it would be beyond the power of a weedy 13.1 hand Indian mule or pony.

The cart should be " close-built," that is, it should have no projecting parts, for the Indian driver trusts implicitly to his animal and never exerts himself to avoid a collision.

Throughout the last campaign the badly built carts have been flying to pieces in all directions; it would be true economy in the end to make carts of the best material only and of the best workmanship.

The above idea is only roughly outlined, but if one or two experimental carts were built at Rurki or at the railway workshops, any weak points would be soon manifest and might possibly be rectified. I only hope a trial may be given.

Too much praise cannot be bestowed on the Engineers for the wonderful speed with which they constructed roads during the last campaign. I think, however, that in places where only stones had to be thrown back they might have been wider with advantage. Any one who has seen frozen Hindus driving starving bullocks on an early morning cannot but wonder how they ever managed to get along some of the narrow parts, and I am sure that a broader road would have saved many an accident.

Before another campaign is commenced the bullock carts ought to be either fitted with breaks or the bullocks ought to have breeching supplied.

It was a pitiable sight to see a train of loaded carts going from Landi Kotal to Landi Khana. The carts were out of all control, and numerous accidents resulted.

Having travelled in America and the Colonies I now mention some of their customs which I think we might adopt with advantage.

It would greatly facilitate accounts, if the maund were discarded from all commissariat transactions.

In America 100lbs make a "short cwt," and 2000lbs, or 20 "short cwt," make a " short ton." The maund is not only an inconvenient measure but it differs all over India. In Peshawar, for example, the Commissariat maund differs widely from that current in the city. As already an arbitrary standard is adopted, it would not be more difficult to insist on the unit weighing one hundred pounds, than eighty. Grain should be

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stored, as in America, in 100lb bags, two of these make a pony load and they can be handled with ease by coolies; when packed the bags should be placed in rows five high; they can thus be counted with the greatest rapidity especially if blocked in squares.

Even up to the present time whole barley is very frequently issued to transport animals in the Khyber. The barley raised in the Punjab, or that which has been stored for any time in the dry parts of the province, becomes so excessively hard, that only mules and donkeys can digest it; the oxen and ponies pass the majority of it whole; not only is the grain thus passed entirely lost, but by giving an emaciated animal this hard indigestible food his already disorganised interior is simply further impaired.

The barley too is frequently mixed with a great quantity of gravel and filth. The remedy for this would be the erection of winnowing machines at all the principal stations where the grain is originally bought. Steam bruising mills should be erected at the base, and advantage should be taken of the water power along the lines, as at Ali Musjid and Landi Khana, which has hitherto been allowed to run to waste, (by us, although the natives have not failed to appreciate its value.)

In America they use small portable wind-mills on almost every estate. And they are well worthy the attention of the Commissariat Department. They crush corn, grind flour and cut chaff, but as wind is an uncertain motive power, horse gear should also be arranged, for spare animals at the station being employed to work them; both wind-mills and the horse gear are now made in a very portable form, each packing on one cart. In the Khyber we have been buying the worst of grass at fabulous prices. Had wind or water mills been erected it might have been turned into chaff. And if the grain had been mixed with it, not only would more of it have been digested but animals would have been induced to eat stuff they then discard; there would have been no waste, consequently, a smaller quantity would have sufficed, whilst the improvement in condition would have been speedily manifest.

In the Colonies and America all forage is invariably "chaffed" and it is looked on as most wasteful not to cut it up. One "sine qua non" for future campaigns will be to secure the services of transport officers who understand more or less about animals. The fact cannot be disguised that many in the last war, through ignorance of the treatment of cattle, must unwittingly have cost Government thousands a month, much delay and often I fear, have unintentionally occasioned great cruelty to animals. To give one instance; last winter I met a man going up to look after the transport cattle at a station where the animals were in a very pitiable state; mangy, coughing terribly and generally debilitated. He was extremely happy, "Government" said he, "are treating us very liberally now, we have got every thing we need," "Yes" I replied, "What are you taking up?" "Oh! I have a baboo on 70 a month, and an office tent, and table, and 2 chairs." "Yes and what else." "Oh! lots of stationery and printed forms." "And have you any medicines"? 'No," "A Salootrie?" "No," "A Nalbund"? "I

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think there is one"! "Have you any spare gear, or clothing or a moochi"? "No, I never thought of these things"—and so the poor man, who was only thirsting to get to the front, was profoundly ignorant of all matters appertaining to animals, and it was no wonder he did not think of such trifles; and yet I fancy they would not have been forgotten by any one who had much experience with horses, although possibly he might not have remembered printed forms.

I would take this opportunity of saying a few words about walers. It does not seem to be generally understood that vast differences of climate exist in Australia. Whilst Victoria, for instance, has at most a temperate climate, Queensland and northern Australia are almost tropical, and yet we get nearly all our horses from Victoria!

My own experience is, that when walers do not get an abundance of *good* grass it is very difficult to keep them in condition, and that it is only an exceptional horse that can really work in the hot weather. I had a long talk with a very large breeder on the Clarence when I was in New South Wales. He said "you people don't give our horses a" "fair chance; you should send your purchasers over here, tell them to go" "and visit the large breeders and let them know what sorts of horses the" "Government really do require, and they will find we shall be very" "glad to do our best for them; and then don't go and buy horses bred" "down south, you should get them as far north as you can; *get a horse*" "*bred in the Tropics to do work in the Tropics.* At present you trust to" "dealers; very good men they are, I dare say, but they only look to" "putting the dollars together; they don't care what sort of animal they" "sell so long as it pays them; out here they will buy anything that is" "cheap—no matter what it is like."

Another thing. The constitutions of many horses are permanently ruined by the suffocation and terrible sufferings they undergo in the passage to India. If Government had its own agents in Queensland and Northern Australia, and had ships specially designed for the transport of horses, just as they have, with such benefit, for the transport of men, I feel certain that we should get a better, if not a cheaper, animal, and one I fancy that would stand the climate as well as the old Cape horses did. In time of war it would often be of immense value to have ships all ready fitted out for transporting horses.

On the Hunter River N. S. W. a Mr. Dangar is breeding Arabs; he had, when I visited him, 3 stallions and 2 Arab mares, some 150 thorough bred Wales mares from which he was raising his young stock. He showed me some ⅞ Arabs which were hardly to be distinguished from pure-bred ones except they were more powerful and larger. These are the animals I should think suited to employ as stallions in India. The stamp of horse that we want here for our Zemindary mares are all gelded in the colonies. I mean small, powerful thorough-breds, but had we a capable purchasing agent out there he could easily arrange to keep a certain number entire.

I think the last campaign has demonstrated that stallions are a great nuisance in every way; they required more attendants, are perpetually fighting and injuring themselves, and go looking about and

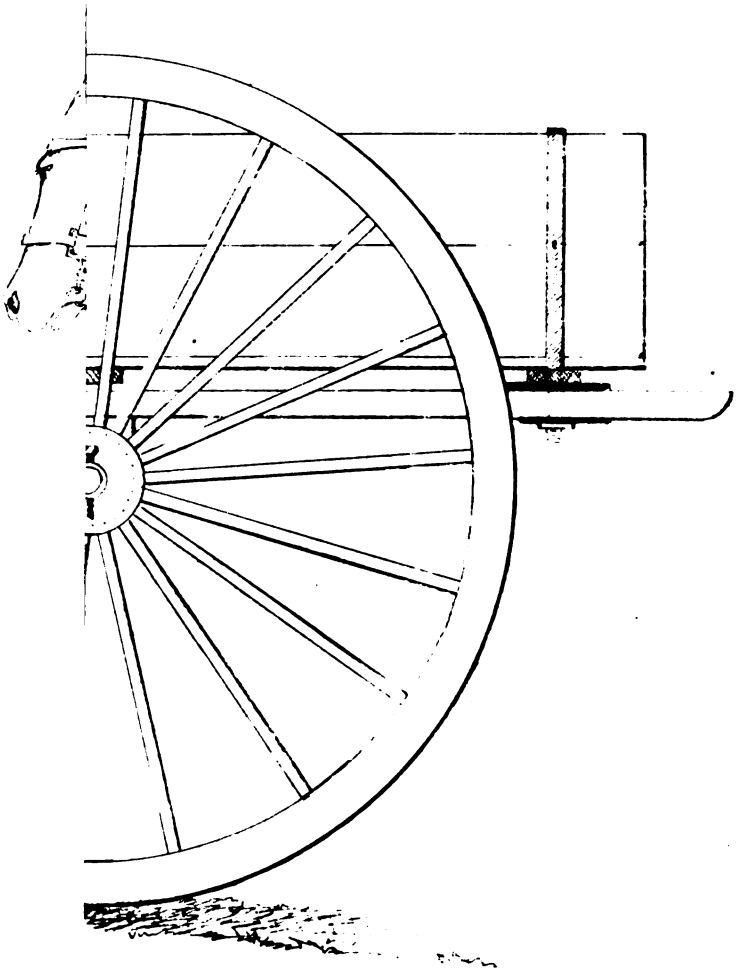
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worrying when they ought to be eating or resting. The people of India although they really prefer a gelding to a stallion, will never castrate until some pressure is put upon them, and the only way that appears to me capable of meeting the evil would be to declare that in, say two years time, there would be a yearly tax of Rs. 5, on every stallion. In the interior Government would grant a reward of rupees fifty, say, to every native who could prove himself able to geld, and also give him, as well, a set of apparatus free. Moreover, sanction should be given to Officers Commanding Cavalry regiments to reward their Salootries for every man taught by them to castrate.

G. GAISFORD, CAPTAIN,

Commanding Khyber Levies.

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